

Reflection on the Integrated Development of Marine Fisheries and Tourism Based on the Transformation of Fishery Facilities: A Case Study of Ningde City of Fujian Province, China

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Abstract Based on the analysis on the current situation of marine fishery resources and development in Ningde City, this paper plans a spatial pattern for the integration of marine fishery and tourism of the “one belt, three zones, and multiple points”, designs key projects, analyzes the existing problems in the integrated development of fishery and tourism, and proposes relevant countermeasures and suggestions.

Keywords Facility fisheries, Integration of fishery and tourism, Fishery and tourism projects, Ningde City of Fujian Province

DOI 10.16785/j.issn 1943-989x.2024.3.016

With the continuous demand for marine fisheries, it has led to the depletion of fishery resources and the increasing fishing intensity. Faced with the decline of fishery resources, marine fishery resources are facing enormous pressure. The scientific intensive aquaculture technology enables fish to grow and reproduce stably and at high production areas throughout the year. The main goal of facility fisheries is to improve the efficiency and yield of fish farming, while reducing environmental pollution and resource waste. By controlling, adjusting, and optimizing factors such as water quality, water temperature, and feed supply, facility fisheries can provide a good growth environment and living conditions, improve the growth rate and yield of farmed fish, and ensure the health and quality of fish. In addition, facility fisheries also have advantages and flexibility, which can adapt to different geographical environments and aquaculture needs, providing important opportunities for the sustainable development of fisheries production. With the advancement of technology and innovation, facility fisheries are playing an increasingly important role in the development of China's fisheries, providing new solutions for increasing fishery output, improving fishery efficiency, and ensuring fishery safety^[1].

The integrated development of fishery and tourism refers to an industrial development model that provides tourists with travel services based on the development of marine fishing and mariculture industries in coastal islands, harbours,

mudflat and other coastal islands, and tourism facilities. It is a combination of primary industry and tertiary industry, belongs to agricultural tourism, and is also a leisure fishery.

General Secretary Xi Jinping pointed out in his book *Getting rid of Poverty* that Ningde should “rely on the mountains and the sea to develop”^[2]. Ningde is located in the eastern part of Fujian Province, with the mainland coastline accounting for one-third of Fujian Province's coastline. It ranks third in the national mainland coastline length city rankings, second only to Dalian and Zhanjiang; marine tourism resources are rich in the waters under its jurisdiction^[3]. With the good development trend of marine fisheries in recent years, it has explored the profound marine fishery culture in the eastern Fujian region, guided the development of ecological fishery facilities tourism, explored innovative development models and working mechanisms for the integration of fishery and tourism, effectively promoted the implementation of pilot projects for the integration of fisheries and tourism, and cultivated new growth points for the marine economy. This is a positive attempt to “read the *Classic of Mountains and Rivers*” and explore the “path of rural revitalization with Fujian characteristics”.

The integration of fishery and tourism is a type of recreational fishery. Recreational fishery in the United States, Canada, Europe, Australia, New Zealand and other western countries and regions refers to all recreational fishing activities for entertainment or fitness purposes, including

inland rivers and lakes or sea sports fishing, leisure gathering, family entertainment and other recreational fishing activities that are different from commercial fishing activities. It is also commonly referred to as recreational fisheries or sports fishing^[4]. Of course, this concept does not include fishing ports or fishing village tourism. The earliest mention of recreational fishery in China was by Taiwanese scholar Jiang Rongji, who believed that recreational fishery refers to the use of fishing village equipment, fishing village space, fishing production sites, fishing methods and tools, fishing products, fishing business activities, natural organisms, fishing natural environment, and fishing village cultural resources. Through planning and design, it aims to play the role of fishing and leisure tourism in fishing villages, enhance the experience of Chinese people in fishing villages and fishery, improve tourism quality, and increase the income of fishermen, promoting the development of fishing villages^[5].

Recreational fishery is a form of fishing that integrates various activities such as leisure, tourism, entertainment, and sightseeing. According to the research by Liu Yadan^[6], the types of recreational fishery should include fishing fisheries, ornamental fisheries, sightseeing fisheries, tourism fisheries, and marine leisure fisheries. In the study by Li Enyuan^[7], the development model of recreational fishery is divided into different types, including production and operation, leisure fishing, sightseeing and leisure, exhibition, education, and community. In the

Received: May 3, 2024 Accepted: June 1, 2024

Sponsored by Innovation Strategy Research Project of Fujian Provincial Department of Science and Technology (2023R0068); “East Fujian Tourism Poverty Alleviation Research Center” Project of Humanities and Social Sciences Research Base of Fujian Provincial Department of Education (Minjiaoke[2019]32); Survey and Research on the Construction Resources of Beautiful Countryside in East Fujian under the Guidance of “the Spirit of the 20th National Congress of the Communist Party of China” at Ningde Normal University (2022DZX08).

Acknowledgement to the contribution of Lin Wenjun, Fangxiao, Zu Gengxin, Zhang Qining, Lin Lianfang, and He Jingning et al. to the paper.

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research by Song Zhenxing^[8], marine recreational fishery is classified into multiple categories based on their management activities, including leisure experience, sightseeing, shopping, fishing village customs, and exhibition and education. In addition, Chai Shousheng et al.^[9] pointed out that the resource function of recreational fishery is mainly to meet different leisure needs in the market. The specific functions of recreational fishery are reflected in the six important industrial elements of “tourism, entertainment, food, housing, shopping, and transportation”. Of course, there is also varying degrees of overlap between these six industrial elements. The development of recreational fishery not only greatly promotes the growth of the fishing economy, but also brings prosperity to the local tourism and related industries. By exploring the diversity and uniqueness of recreational fishery resources, tourists can be provided with different leisure experiences and cultural exchanges, while also promoting the increase of fishermen’s income and the achievement of sustainable development goals in the fishing industry.

These concepts, definitions, types, and research fields have little overlap. The integrated development of marine fisheries and tourism based on the renovation of fishing facilities is a new research object and a new field for the development of recreational fishery. This topic helps to enrich the scope of recreational fishery research.

1 Overview of marine fisheries in Ningde City

1.1 Overview of marine resources in Ningde City

Ningde City is located on the southeast coast of China and has abundant marine resources. Ningde has a sea area of 46,000 km², a mudflat area of 43,000 hm², and a reclamation area of 14,500 hm². According to statistics, the total culturable area of shallow mudflat in Ningde City has reached 90,000 hm², which has great development potential and has become an important space resource for marine development and utilization. As a region rich in marine resources, Ningde City has a very superior marine ecological environment. The sea is vast, with clear water quality and abundant marine biological resources. The richness and diversity of these resources provide vast space for the development of industries such as fisheries, aquaculture, and marine tourism in Ningde City. Ningde City focuses on the rational utilization and sustainable development of marine resources. Through scientific fisheries management and

environmental protection measures, Ningde City strives to maintain the balance of marine ecology, and protect and restore the diversity of marine organisms. At the same time, Ningde City actively promotes the development of the marine industry, encourages investors and entrepreneurs to participate in the development and utilization of marine resources, and promotes the prosperity of the marine economy. In the process of developing and utilizing marine resources in Ningde City, it should adhere to the principle of sustainable development, pay attention to ecological environment protection and rational utilization of resources, and ensure the sustainable utilization of marine resources. Only by fully leveraging the advantages of rich marine resources in Ningde City and rational development and utilization of marine resources can sustainable economic and social development be achieved. Ningde City regards the protection and utilization of marine resources as one of its important tasks, providing not only a favorable environment and conditions, but also opportunities and platforms, providing solid support for the rapid and sustainable development of the marine industry. It is believed that with the continuous development and growth of the marine industry in Ningde City, it will make greater contributions to the prosperity of the local economy and the well-being of the people.

The coastline of Ningde City starts from Shacheng Bay of Fuding City in the north and extends to Sandu Bay of Ningde in the south. The mainland coastline is 1,046 km, with 448 islands and an island area of 125.91 km². Ningde City has a vast sea area and abundant marine biological resources and biodiversity. The eastern Fujian sea area is one of the regions with the best marine ecological environment in Ningde City, with various types of marine biological resources. According to statistical data, there are an astonishing number of fish species living in the sea area, over 500 types. Among them, there are over 100 species classified as economic fish, while crustaceans and shellfish account for over 60 and 70 species, respectively. The diversity of its biological species greatly enriches the marine ecological environment of Ningde City. The

rare species Chinese white dolphin has also been found to live in this sea area, which provides a guarantee for protecting and maintaining the living environment of this species. In addition, Ningde City is renowned for its developed marine aquaculture industry. Here, various types of marine aquaculture businesses can be carried out, including fish, shrimp, shellfish, algae, and other marine products. It is worth mentioning that the yellow croaker spawning ground is also located here, injecting new vitality into the marine aquaculture industry in the region, making the development of the yellow croaker aquaculture industry in Ningde City smoother and becoming one of the business cards of the entire national yellow croaker aquaculture industry. Ningde City is known as the largest cage breeding base in China for its huge scale, astonishing output, and huge output value, and its position is unique nationwide. The unique fishery resources have laid a solid foundation for the development of marine fishery tourism resources in Ningde City.

1.2 Overview of facility fisheries in Ningde City

Firstly, the fishery production in Ningde is mainly based on seawater and supplemented by fresh water. In recent years, the total value of fishery production has steadily increased (Table 1).

Seen from Table 1, the fishery production in Ningde is mainly based on seawater and supplemented by freshwater; the fishery economic output value, total fishery output, and seawater product output of Ningde City have been increasing year by year; the increase in freshwater product production in Ningde City is not significant, with a freshwater product production of 47,900 t in 2022, a decrease of 4.2% compared to 2021.

Ningde City has always attached great importance to the protection of marine ecological environment. In response to the problems in the aquaculture industry, investment has been increased in the renovation of marine fishing and tourism facilities in recent years, and significant results have been achieved. It is reported that in July 2018, the Ningde Municipal Government actively launched a two-year comprehensive improvement action for marine aquaculture, covering four coastal counties (cities, districts). In

Table 1 Output value of marine fisheries in Ningde City (2018–2022)^[10]

Year	Fishery economic output value//10 ⁸ yuan	Total fishery production//10 ⁴ t	Seawater product production//10 ⁴ t	Freshwater product production//10 ⁴ t
2018	246.83	96.70	92.06	4.65
2019	258.58	101.71	96.87	4.84
2020	266.27	103.49	98.59	4.90
2021	318.41	106.53	101.53	5.00
2022	343.20	107.20	102.44	4.79

this action, the Ningde Municipal Government invested a total of 4.548 billion yuan in various types of funds, including partial investment from farmers. This action mainly targeted and rectified 267,100 fishing rafts in the prohibited breeding areas, and adopted clearance measures for 4,367 hm² of shellfish and algae. At the same time, the breeding facilities in standard and restricted breeding areas were upgraded and transformed, promoting the transformation and upgrading of traditional breeding industry. In addition, Ningde City also retired 194,800 fishing rafts, cleaned up 264,000 waste fishing rafts, and disposed of 104,000 t of floating garbage and 5.35 million foam floats^[8].

In the rectification action, the Ningde Municipal Government has also strengthened the supervision of the breeding industry and cracked down severely on behaviors that violate relevant regulations. The implementation of these measures has promoted the transformation and upgrading of the aquaculture industry in Ningde City, effectively maintained the marine ecological environment, and improved the production and life quality of fishermen. The Ningde Municipal Government will continue to promote the rectification of the aquaculture industry, promote the transformation and upgrading of traditional aquaculture, and strive to achieve an organic combination of marine economic development and ecological environment protection; implement the strategy of “compressing and transforming within the bay; expanding and enhancing outside the bay.”

During the “14th Five-year Plan” period, it should promote the construction of “maritime Ningde”, promote the upgrading of the entire industry chain, improve the quality of coastal tourism, and enrich the connotation of coastal tourism.

1.3 Current situation of integrated development of fishery and tourism in Ningde City

In recent years, Ningde City has introduced social capital investment, and fishery and leisure facilities in the city have been improved to a certain extent. Only Xiapu County actively guides social capital to invest in coastal scenic spots, photography sites, and rural tourism sites to build rural main homestays, rural guesthouses, and other rural tourism supporting facilities, improve the rural tourism service system, and gradually create a number of relative rural tourism homestays such as Caomuren, Shijianhai, and Leyouzhai. Xiapu attracts more than 400,000 photography enthusiasts to come and collect scenery every year.

2 Planning and design of spatial layout for the integration of fishery and tourism in Ningde City

2.1 Spatial layout for the integration of fishery and tourism in Ningde City

Based on the characteristics of the sea area and regional characteristics of Ningde City, focusing on “vigorously developing facility fisheries, and promoting the transformation and upgrading of fisheries”, combined with the development vision of “prosperous fisheries, beautiful fishing villages, and rich fishermen”, and focusing on modern characteristic fisheries leisure vacation+mountain and sea sightseeing tourism, efforts are made to write about the characteristics of the leisure sea, fishermen’s sea, blue sea, and prosperous sea in eastern Fujian. The integrated development of marine fisheries and tourism in Ningde City is divided into a link belt for integrated development of fisheries and tourism, a mountain and sea leisure tourism zone, a light and shadow vacation tourism zone, and a fishing tourism experience development zone, as well as a multi-point development pattern, namely the pattern of one belt, three zones and multi points. The Ningde Coast is built into a sea tourism corridor for mountain and sea Ningde, and a self guided harbor.

2.1.1 One belt: link belt for integrated development of fishery and tourism. Starting from Fuding City in the north and ending at Jiaocheng of Ningde in the south, passing through Xuncheng Village of Fuding–Guayuan–Long’an–Xiaobailu–Dabailu–Wanggu–Minzao–Chuanshi–Shanghuangqi–Dayuandang–Xiaoyuandang –Niulanggang–Baiyang–Yacheng–Xiapu–Shajiang–Xiapu Seven Stars–Xi’nan–Yantian–Xipi–Jiaocheng of Ningde, the highway serves as a coastal sightseeing belt, connecting Shacheng Bay, Qingchuan Bay, Funing Bay, and Sandu Bay. Through the construction of this Mindong No.1 Highway, the marine bay area, facility fish rafts, marine photography, and resources of seaside fishing villages in Ningde City will be connected, constructing a world-class coastal landscape sightseeing and roaming belt. Ultimately, a link zone for integrated development of fishery and tourism is built, running through the space of “mountain and sea Ningde, and free travel”, and providing sustainable passenger flow and product space for the integrated development of marine fishery and tourism in eastern Fujian.

2.1.2 Three zones: mountain and sea leisure tourism zone, light and shadow vacation tourism zone, and fishing tourism experience development zone.

(1) Mountain and sea leisure tourism zone. Based on the marine natural resources and fishery facilities resources of Fuding Shacheng Bay, Minzao Bay, and Qingchuan Bay, relying on the tourist resources of Taimu Mountain Scenic Area and Yushan Island Scenic Area, integrating mountain and sea natural resources and tourist market resources, a mountain and sea leisure tourism zone is built.

(2) Light and shadow vacation tourism zone. Relying on the marine natural resources, fishery facilities resources, light and shadow climate resources in the Dongwuyang area of Xiapu Lishan Bay, Funing Bay, and Sandu Bay, as well as the tourist resources Dongchong Peninsula Provincial Scenic Area, and leveraging the tourist resources of Xiapu as an international photography base, a light and shadow vacation tourism zone is built.

(3) Fishing tourism experience development zone. It mainly refers to all the sea areas involved in Guanjiangyang, Fudingyang, Qingshan Island, Doumu Island, and the west of Dongchong Island in the Sansha Bay area of Sandu Bay. The construction of a fishing tourism experience development zone meets the needs of Ningde as the main urban area of eastern Fujian with rapid economic development and talent gathering, as well as the development opportunities brought by its location advantage as the backyard of Fuzhou.

2.1.3 Multi points. Based on the characteristics of marine resources and the integrated development of fishery and tourism in Ningde City, as well as the layout of the pilot project for the integration of fishery and tourism in Ningde City, key fishery and tourism integration projects are arranged along one belt and three zones to provide tourists for the mountains and seas of eastern Fujian with product experience of marine tourism characteristics. This mainly includes key construction points such as the facility fish raft project in Shacheng Bay area, the Seven Star Fish Raft in Xiapu, the Blue Sea Fishing Song Fish Raft in Ninghai Village of Fu’an, and the Qiuzhu Village Fish Raft in Jiaocheng in Sandu Bay area.

2.2 Design of key projects for the integration of fishery and tourism in Ningde City

2.2.1 Coastal scenic road in eastern Fujian. Coastal scenic road in eastern Fujian, also known as the link belt of integrated development between fishery and tourism, starts from Fuding City, a county-level city under Ningde City in the north, and extends south to the coastal road in Jiaocheng District, Ningde City. The

development trend of marine tourism in Ningde City is rapid. In order to further enhance the value and attractiveness of tourism resources, a tourist road of 320 km long is planned to be built to meet the growing demand for tourism. During the “14th Five-year Plan” period, it is expected that the total length of the road sections to be completed and connected will be 221 km. Specifically, in this plan, Jiaocheng District plans to build 33 km of roads, Fu’an City plans to build 29 km, Fuding City plans to build 96 km, and Xiapu County plans to build 63 km of roads. At the same time, this tourist road will focus on creating a distinctive section of approximately 139 km. The entire tourist road will highlight the regional characteristics of Ningde City and create the brand of “Geological View · Mountain and Sea Ningde”. In specific tourism road planning, each district and county will also create landscapes according to their own actual situation. Jiaocheng District will conduct landscape planning around the theme of “Binhai New City · Happy Jiaocheng”; Fu’an City will focus on landscape construction with the theme of “Mountain and Sea Countryside · Charming Fu’an”. Fuding City plans to carry out more comprehensive landscape design with the core of “Sea Fairy City · White Tea Hometown”, and conducts planning in combination with the city’s characteristic white tea culture. Xiapu County, with the theme of “Mudflat Charm · Beautiful Xiapu”, ingeniously combines the unique natural landscape and cultural heritage of the region, and will actively carry out landscape layout and transformation to create a unique mudflat landscape. Through such landscape planning, the tourism roads in Ningde City will better showcase the characteristics and charm of each district and county, and enhance the attractiveness and popularity of the entire tourism route.

Fujian Mindong No.1 Highway is built to become the most beautiful scenic coastline in Fujian Province that connects land and sea. Integrating elements such as economy, culture, transportation, and travel, and improving road grade standards and related auxiliary infrastructure layout, the common development of coastal villages, docks, coastal fish rafts, and various scenic spots is achieved.

2.2.2 Coastal leisure tourism resorts.

(1) Mountain and sea leisure tourism zone. Based on the marine natural resources and fishery facilities of Fuding Shacheng Bay, Minzao Bay, and Qingchuan Bay, relying on the tourist resources of Taimu Mountain Scenic Area and Yushan Island Scenic Area, integrating mountain

and sea natural resources and tourist market resources, a mountain and sea leisure tourism zone is built.

① Little Egret Leisure Resort. Little Egret Bay Resort in Fuding, Fujian is located south of Shacheng Port and boasts a high-quality beach. The beach is wide and soft, with gentle slopes and peaceful waves, making it a beautiful beach bathhouse. The vegetation on both sides of the surrounding area is lush, and the strange rocks and steep cliffs are even more beautiful. When standing on the mountaintop to overlook the sea, one can see the vast expanse of smoke and waves, making one feel as if they are in a fairyland. When looking up the mountain from the seaside, one can appreciate the unique peaks and rocks, which are rich and colorful. Here, tourists can also taste fresh seafood and enjoy delicious food. At present, the Little Egret Bay Resort has been built into the Little Egret Seaside Resort, and the future focus will be improved in accordance with the standards of 4A level scenic area on the existing basis.

② Minzao Bay Leisure Tourism Zone. The project is located in the surrounding waters of Minzao Bay and mainly consists of the coastal areas of Dabailu Village, Wanggu Village, and Chuanshi Village. The coastal coastline is winding, with beaches scattered throughout the bay. The surrounding sea environment is relatively good, and leisure tourism has not yet been developed. This block belongs to the industrial and urban sea area of Minzao Bay. Key points of development: based on the characteristics of the coastal fishing villages of Dabailu Village, Wanggu Village, and Chuanshi Village, combined with rural revitalization, the tourism theme image of the fishing village is condensed, and it is developed in a staggered manner with Niulanggang and Little Egret to avoid the phenomenon of tourism homogenization.

③ Qingchuan Bay Leisure Tourism Zone. As a charming coastal tourist destination, Fuding City in Fujian Province boasts numerous stunning scenic spots, including Niulanggang Coastal Tourist Area and Baisha Bay Coastal Resort. The Niulanggang Coastal Tourism Scenic Area is located in the southeast direction of Qinyu Town, Fuding City, only 23 km away from the national scenic area of Taimu Mountain. This desirable resort is located on a mountain and by the sea, facing the beautiful Yushan Island across the sea, with picturesque scenery. The beach at Niulanggang is flat and clean, surrounded by green trees, mountains and water, allowing people to feel the pleasant beauty of

nature while immersing themselves. In addition, the surrounding reefs have various shapes, such as Yuanyang Reef, Zhinv Cave, and Haishang Yixiantian, adding to the unique charm of this coastal area and the unique natural scenery. Here, tourists can enjoy the magnificent beach scenery and feel the charm of nature. The construction theme of the Cowherd and Weaving Maid in the scenic area is distinctive, with existing facilities and products such as beaches, slides, boardwalks, sea viewing pavilions, and seafood restaurants. On the basis of existing scenic area construction, it is upgraded according to the standards of 4A level scenic area.

Baisha Bay Beach Resort is located in Baisha Bay Beach and its surrounding areas of Xiamen She Ethnic Township of Fuding. Marine natural resources of Baisha Bay such as beach and marine erosion landform have good endowments, but the sand quality, seawater, leisure facilities, and surrounding environment should be further improved and enhanced. Currently, the sea belongs to the fishing well, agricultural and fishery area. The existing beaches and seawater should be cleaned up and improved to enhance the leisure safety environment; a popular science area for marine erosion landforms is developed, to showcase diverse marine erosion geological landforms; it should strengthen the construction of beach projects and related supporting facilities and equipment, making it Baisha Bay Coastal Leisure and Resort Center that integrates leisure, entertainment, and sightseeing.

(2) Light and shadow vacation tourism zone. The scope of light and shadow vacation tourism zone includes Yacheng Bay, agricultural and fishery area of Funing Bay, Changbiao reserve area, and Dongwuyang area. It includes four development blocks for fishery and tourism projects, namely agricultural and fishery area of Yacheng Bay, agricultural and fishery Area of Funing Bay, Changbiao reserve area, and Dongwuyang area. The project is evenly distributed on land in coastal industrial and urban bay areas, and does not involve offshore construction.

2.2.3 Key project development for the integration of fishery and tourism.

(1) Bachimen Seaside Restaurant. The project is located in Bachimen of Shacheng Town, the southeast of Fuding City, at the exit of Bachimen Expressway, about 500 m away. Currently, it is a new type of plastic fishing raft, mainly engaged in catering. The transportation is convenient, and the onshore parking lot, slope protection, and land sea connection facilities

need to be improved. The surrounding landscape and fish raft theme need to be improved, and the current sea use belongs to the reserved area.

It should strengthen the design of integrated project of fishery and tourism, such as sea fishing, accommodation, seafood barbecue, etc. In terms of facility fishing rafts, fishing raft landscape sketches and marine landscape sketches are added, such as "Rising Moon on the Sea". Focusing on theme construction, a night view project for fishing rafts and differentiated and distinctive leisure fishing rafts are created.

(2) Sea Dream Sea Restaurant. The project is located in Yaojiao Village, Anren Village, Jiayang Township. At present, fishing rafts are mainly made of wooden houses and deep-water plastic net cages, with wooden floors and bridges connected to the ground, forming a good integration with the surrounding environment. The combination of resources such as bridges, fishing rafts, islands, mangroves, and houses is good. The current used sea belongs to the reserved area, and Yaoyu Island belongs to the approved land reclamation. "Water Fishing Village of Jiayang Township" and "Maritime Party Branch of Jiayang Township" have been established.

Tourism service facilities such as tourist service centers and parking lots need to be further improved, and the fishery and tourism integrated products needs to be further enriched. According to the plan, the area will construct and equip multiple tourism supporting facilities, including but not limited to a sea tourist reception center, high-end sea homestays, tourist restaurants, sea leisure and sightseeing squares, sea and land floating bridges, yachts, parking lots, and ocean science popularization museums. These facilities will together form a sea leisure tourism complex that integrates food, accommodation, entertainment, and education. This plan will become the first comprehensive maritime tourism area in Fuding to integrate aquaculture, fishing, accommodation, and procurement, further promoting the rapid development of local tourism industry. The marine tourist reception center will provide convenient services, including information consultation, ticket purchase, and tour guidance for tourists. And high-end homestays at sea will provide high-quality accommodation experiences, allowing tourists to experience a relaxed and comfortable vacation atmosphere at the seaside. The tourist restaurant will provide delicious seafood and local specialty dishes, allowing visitors to taste authentic Fuding cuisine. The sea leisure and sightseeing square will provide tourists with a place for leisure,

entertainment, and sightseeing, allowing them to fully enjoy the beautiful scenery of the beach. The sea and land pontoon bridge will facilitate tourists to reach offshore facilities from land and provide convenient transportation connections. Yachts and parking lots provide convenience for tourists as sea transportation and parking lots. The ocean science popularization museum will introduce ocean knowledge to tourists, increasing their understanding and conservation awareness of ocean.

(3) Shacheng offshore fishing rafts. The project is located in the Shacheng agricultural and fishery area in the northwest of Shacheng Town. There are 205 households in Shacheng Town that cultivate fish rafts. The entire town has 561 new plastic large net cages and 1,454 small net cages that have been launched. The net cages in the northwest sea surface of Shacheng Town are scattered and magnificent. Tourism development is still in the exploratory stage, and the current used sea belongs to agricultural and fishery area.

(4) New marine ranch in Qixing Village sea area. The project is located in the sea area near Qixing Village in Xiapu. In this azure sea area, you can see large areas of deep water large net cages and small net cage fishing rafts arranged neatly, presenting an orderly scene. In the Qixing sea area, a total of 252 deep-water net cages were launched, and traditional small net cage fishing rafts were modified. The number of renovations to small net cage fishing rafts exceeds 8,000, making Qixing sea area become the largest demonstration site for the renovation of contiguous fishing rafts in Ningde City. Through this transformation, the fishing rafts in the sea area have been further optimized, providing a good demonstration and model for fishery development and protection. The maritime transportation terminal is located at Dong'an Port, which has a backward environment and has not yet formed a tourist waterway and tourist ships. The construction of this remediation demonstration site has played a positive role in promoting the development of fisheries. By arranging fishing rafts in an orderly manner, the efficiency of fishery production and the quality of aquatic products can be improved. Meanwhile, this transformation also helps to protect the marine environment and reduce the impact of fishing activities on marine ecosystems. The experience of constructing demonstration sites for remediation can also provide reference for other regions, promoting sustainable development of fisheries and marine ecological protection.

Key points for integrating fishery and tourism: a small tourist pier is built in Qixing Village to facilitate tourists to directly travel from Qixing Village to Qixing fishing raft; a five-star fish raft restaurant is built to collect famous seafood dishes from Xiapu mudflat and cook seafood caught by tourists from deep sea; a number of fishing raft homestays are set up. The main decoration style of the homestay is Xiapu mudflat photography and coastal scenery. The internal facilities of the homestay should meet the standards of the internal facilities of three-star hotels and above, as a demonstration site for Ningde fishing raft accommodation. Fishing raft tourism experience projects are designed, such as sea golf, sea fishing, sea cycling, sea BBQ, sea internet celebrity check-in points, etc. A series of fishing and tourism festival activities are designed, such as the Qixing "Fishing" Festival and the Ocean Ranch "Harvest Festival". Taking the Qixing fishing raft as a breeding base for fishery and tourism Internet celebrities, local Internet celebrities responsible for local traffic are invited to conduct live broadcasts for promotion. The content of the promotion can include the scenery of the fishing raft, seafood mukbang, fishing and tourism experience activities, etc. One of the fishing raft cabins is transformed into a deep-sea fishing gear exhibition hall, which can collect some knowledge of deep-sea fishing gear and deep-sea fishing as the main content of the component exhibition hall. Literary and artistic activities of fishing raft are regularly held, and Xiapu County cultural and artistic clubs are contacted to hold cultural and artistic evening performances of fishing raft every weekend.

(5) Qiuzhu fishery and tourism demonstration zone. The project is located on the Cheng'ao Peninsula in Jiaocheng District, Ningde City, in the north and west of Qiuzhu Village. The port highway passes through adjacent shorelines, on the north side of Bijia Mountain, facing the sea. The main marine cultivation includes kelp, asparagus, as well as abalone and yellow croaker farming.

The demonstration zone is named "Sandu Wenyu" and perfectly combines fishing production with leisure tourism. It is built in the Qiuzhu sea area, relies on the beautiful Sandu Island, and uses fish as a medium and the sea as a platform. By introducing projects such as sea golf and ocean fishing, targeting high-end business people and enterprises as demand groups, it is committed to creating the first and largest sea leisure and social platform, supplemented by characteristic amusement, specialty catering, and product sales, to showcase

the beauty of Sandu Island's nature, culture, production, and technology, and create Sandu Island's tourism business card and Ningde's marine industry business card. At the same time, the region is also a fishing e-commerce experience center and practitioner club, fully leveraging its comprehensive functions.

(6) Lanhai Yuge fishing raft. The project is located in Ninghai Village, Xiabaishi Town, Fu'an City, Fujian Province. The surrounding environment is picturesque, with a mild climate and a graceful and charming atmosphere.

Ninghai Village is a beautiful seaside village in Fu'an City, Ningde City, Fujian Province. In order to further leverage the tourism advantages of Ninghai Village, the village plans to build a tourism project called Qika Ocean Park on the sea surface 500 m away from the village. In the offshore area, Qika Ocean Park plans to construct a series of ocean entertainment projects, such as underwater walks, ocean tiramisu, sea hot air balloons, etc., to attract tourists to experience the beauty of the ocean. In the sandy area, a variety of beach entertainment and landscape viewing projects will be provided, such as beach volleyball, grass football, motorboats, sailboats, paragliding, etc. At the same time, the resort hotel section will also provide high-quality accommodation experiences, allowing tourists to experience a relaxed and comfortable vacation atmosphere here. The specialty catering section will provide a variety of culinary experiences, including local specialty cuisine and international catering, to provide tourists with more diverse and comprehensive dining options. In the onshore area, Qika Ocean Park will also build scenic spots and historical sites full of cultural connotations, such as ancient beacon towers and folk cultural centers, to provide tourists with a deeper cultural experience.

A large circular deep-sea net cage is planned and designed in the shape of a watch. The diameter of the circular boardwalk is 200 m, with a sea area of approximately 141,600 m². The sightseeing boardwalk is 628 m long and 5 m wide. The platform is equipped with a tourist reception center, marine culture exhibition hall, Yuanxin Culture Square, 10 sea view room leisure areas, 4 observation platforms, 2 fishing areas, 4 parking areas for passenger boats, 2 parking areas for yachts, 2 parking areas for fishing boats, and 2 parking areas for motorboats. There are 100 guest room berths, and 200 speedboats can be accommodated, and it is expected to accommodate 1,000 people at the same time.

(7) Xipi water township fishing village. The project is located in Xipi Village, Xiwei Town,

Fu'an City. The area has completed the construction of supporting infrastructure such as fishing raft cabins, education centers, fishing centers, and fishermen's homes, providing accommodation and reception, fishing technology exchange, instant seafood, and other leisure tourism information services for fishing enthusiasts and tourists. Starting from March 2018, the area has launched trial operations for natural fishing and cultural education for boatmen ashore, which can accommodate nearly 100 people for leisure fishing and sightseeing at once.

It is planned to renovate an education base of 150 m², construct 50 fishing raft wooden houses, a fishing center of 5,333 m², and a fisherman's home of 300 m². The fishing raft material is high-density polyethylene, environmentally friendly, non-toxic, and recyclable. It meets the standards of various enterprises, and cement, sand, and steel bars meet the construction requirements.

3 Urgent problems to be solved in the integrated development of fishery and tourism

3.1 Unclear approval authority for the integrated projects of fishery and tourism

The current approval department for the integration project of fishery and tourism is not yet clear, and there are difficulties in the approval of sea area use rights in practical operation. There is no approval authority for the construction of offshore fish rafts and homestays, as well as offshore "fishing" family entertainment. There is no clear approval department for the use rights of sea transportation routes and sea sightseeing yachts, and the integration projects of fishery and tourism lack prerequisites in the operation process.

3.2 Lack of relevant standards for the construction of integrated projects of fishery and tourism

There are no construction or evaluation standards for the construction of offshore fishing rafts and homestays; tourism projects need to be accompanied by entertainment, accommodation, etc., but the policy is not clear, and the layout is affected. There are onshore standards for environmental protection and oil fume emissions, but there are no offshore emission standards. Maritime fire safety issues, safety issues, business registration issues, and other related issues involve multiple management. There are standards for the construction of onshore wharves, but there are no relevant standards for the construction of onshore

wharves related to fishing and tourism projects, often mixed with passenger and freight wharves.

3.3 Investment and financing issues in the integration projects of fishery and tourism

How to attract investment in these projects that the government plans to construct or to generate, and how to integrate private capital, social capital, and state-owned enterprise investment. The current focus of government finance is on the renovation of offshore facilities and the construction of facilities fish rafts. However, there is insufficient or missing investment in the infrastructure construction of ecotourism islands. Projects that urgently need to be repaired along the coastline of tourist areas, such as artificial beaches, should be approved and given special subsidies by the government.

4 Strategies and suggestions for the integrated development of fishery and tourism

4.1 Establishing a comprehensive coordination organization

In order to promote the integrated development of the fishery and tourism industry, it is recommended to establish a comprehensive coordination agency to achieve unified coordination and joint efforts among relevant departments. When establishing a comprehensive coordination agency, substantive adjustments need to be made, including adjustments in administrative subjects, personnel, responsibilities and authorities. It should identify a competent department responsible for the integrated development of the fishery and tourism industry, responsible for formulating policies and plans, and coordinating cooperation and communication among relevant departments. A professional team could be built, including industry experts, management personnel, etc., to provide professional technical support and management services, and assist in the operation of the comprehensive coordination organization. The most important thing is the adjustment of responsibilities and authorities. The comprehensive coordination agency should have authority and coordination across departments and regions, and be able to provide unified coordination and guidance to various relevant departments and lower level governments, integrate existing resources, and promote the integrated development of the fishery and tourism industry. By establishing a comprehensive coordination agency and making substantial adjustments, a collaborative effort can be formed to promote positive interaction and close cooperation among relevant departments

and lower level governments, fully leveraging the advantages of all parties and promoting the implementation of integrated development in the fishing and tourism industry. This will help promote resource sharing and complementary advantages, improve the comprehensive efficiency of the fishing and tourism industry, and promote the sustainable development and enhancement of local economy. At the same time, the comprehensive coordination agency can also strengthen publicity and promotion, rational planning, and resource management, enhancing the competitiveness and influence of the fishing and tourism industry in domestic and foreign markets. Safety issues, specific approval authority, environmental protection, fire protection, etc. could be coordinated. Based on the establishment of comprehensive institutions, the supervision and approval of projects such as the construction of offshore accommodation facilities and the right to use sea routes for sightseeing yachts are implemented to improve the efficiency of project promotion.

4.2 Introducing policies and standards related to the integration projects of fishery and tourism

Referring to the relevant plans and opinions prepared by the Fujian Provincial Bureau of Oceanography and Fisheries and the Fujian Provincial Department of Culture and Tourism on promoting the integrated development of the three industries of fisheries, measures and opinions on promoting the integrated development of marine fisheries and tourism in Ningde City are formulated, and the development direction of the fishing and tourism industry in Ningde City is comprehensively guided, in order to build a good policy environment for promoting the integrated development of fishing and tourism industries in Ningde City.

It is recommended that the Ningde Marine Fisheries Bureau, in collaboration with the Cultural and Tourism Bureau, commission relevant units to conduct sufficient research, introduce and implement group standards for fishing raft homestays, fishing raft catering, etc.

Recently, according to the evaluation criteria for “water towns and fishing villages”, support has been provided for the brand construction

of local “water towns and fishing villages”, achieving a gradual development from point to area. In the medium and long term, standards and service specifications for the integration of fishing and tourism will be introduced, and demonstration and standard projects for the integration of fishing and tourism will be regularly selected to strengthen supervision.

4.3 Strengthening communication and investment attraction

It should organize communication and learning. Through methods such as “inviting in and going out”, it should visit successful enterprises or project sites in the fishing and tourism industry in Zhejiang, Taiwan, and other regions for learning and exchange. At the same time, relevant successful enterprises are invited to share their experiences.

It should strengthen communication and cooperation with relevant departments and lower level governments. By regularly holding meetings, symposiums, and seminars, it could promote in-depth exchanges and cooperation among all parties, and jointly formulate policies and plans for the integrated development of fishing and tourism. An information sharing mechanism could be established, to timely transmit the latest information and opportunities for investment promotion, and provide comprehensive market intelligence and policy guidance for investors.

It should strengthen marketing and brand promotion. By utilizing various media channels, targeted investment project information and development prospects could be disseminated, to enhance the visibility and image of integrated development of fishing and tourism. It could organize promotional activities in key domestic and international markets, participate in industry exhibitions and exchange conferences, strengthen connections with investment institutions, travel agencies, hotel groups and other partners, expand investment channels, and attract more funds and resources to invest in the integration projects of fishing and tourism.

It should coordinate with the Fujian Provincial Oceanic and Fisheries Bureau, Fujian Provincial Department of Culture and Tourism, and actively participate in project promotion and investment fairs to enhance its visibility and reputation. At the same time, measures such as

setting up special support funds and promoting the role of financial services should be taken to effectively carry out the construction of fishing and tourism projects. It is recommended that the government provide special subsidies for the problem of repairing the shoreline of tourist areas (artificial beaches). It is suggested that the Marine Fisheries Administration strengthen its coordination role in the integrated development of marine fishing and tourism, and require subsidies for newly built fishing rafts that meet the requirements of the integrated fishing and tourism projects to be based on past government subsidy standards.

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