

# Development Model in HT Port Area Industry of Xiaoqinghe Navigation Resumption Project

Xiao Liu

Business School, Shandong University of Technology, Zibo, China

**Abstract:** Studying the operation and development mode of Lingang Industrial Park, analyzing and planning the spatial layout of Lingang Industrial Park, will have important guiding significance for promoting the development of regional Lingang Industrial Park. An in-depth analysis of the development model and spatial layout of the HT Port Area Lingang Industrial Park in the Xiaoqinghe Navigation Restoration Project is beneficial for improving the overall operational efficiency of the HT Lingang Industrial Park, optimizing the industrial structure, and accelerating the pace of economic development in Zibo City. This article first explores the current development status of the HT port industry in the Xiaoqinghe Navigation Resumption Project based on relevant concepts and basic theoretical research. Secondly, taking Shanghai, Tianjin, Japan, and Rotterdam as typical cases, it analyzes the four existing operating models of the inland river port industrial park, providing reference for the industrial layout of the HT port area in the Xiaoqinghe Navigation Resumption Project. Finally, suggestions and strategies for the future development of HT Lingang Industrial Park are proposed.

**Keywords:** Lingang Industrial Park; Industrial development; Pattern analysis; enlightenment.

## 1. Introduction

Water transportation has advantages such as low investment, small land occupation, large transportation capacity, low freight rates, and light pollution. Vigorously developing water transportation is not only necessary for achieving sustainable transportation development, but also for building a resource-saving and environmentally friendly society. Accelerating the construction of inland waterways and the development of water transportation is of great strategic significance for promoting the transformation of regional economic growth mode, accelerating the optimization and upgrading of industrial structure, improving the investment environment, enhancing the level of rational development and comprehensive utilization of water resources, and advancing the process of industrialization, urbanization, and agricultural modernization [1-2].

Since the reform and opening up, the inland waterway transportation in Shandong Province has developed rapidly, especially since the Ninth Five Year Plan and the Tenth Five Year Plan. The infrastructure conditions of the Jining to Zaozhuang section of the Beijing Hangzhou Canal have been significantly improved, the navigation capacity of the waterway has been greatly enhanced, and the transportation adaptability has been significantly enhanced. It has become a "golden waterway" serving regional economic development and a "benefiting waterway" for poverty alleviation and wealth creation for the people. However, with the development of the economy and society, compared with other transportation modes and developed provinces and cities, there is a significant gap in the development speed and technological level of inland water transportation in Shandong Province. The main manifestations are: outdated infrastructure, prominent structural contradictions, lack of construction funds, imperfect management system, uncoordinated external environment, insufficient comprehensive utilization of water resources, etc., which cannot well adapt to the needs of rapid economic and social development.

Since entering the 11th Five Year Plan, the country has increased investment in inland waterway infrastructure construction, and the country's inland waterway transportation has entered a new period of rapid development. In 2011, the State Council issued the "Opinions on Accelerating the Development of Water Transport in Inland Rivers such as the Yangtze River"; The Shandong Provincial Government also took the opportunity to issue the "Opinions on Implementing the State Council Document [2011] No. 2 to Accelerate the Development of Inland River Water Transport", and in 2012, together with the Ministry of Transport, approved the "Layout Plan for Inland River Waterways and Ports in Shandong Province". The Shandong Provincial Party Committee and Government officially started the construction of the Xiaoqing River Navigation Resumption Project in 2019, and planned to complete the construction of the Huantai Port Area of Zibo Port in 2023, along with the construction of the Maqiao and Jingjia operating areas, opening a new era of shipping.

## 2. Current Development Status of Port Industry in HT Port Area

### 2.1. Development situation of the economic hinterland

Zibo is an important industrial base in China, with an industrial system involving 35 major industrial fields such as chemical, pharmaceutical, building materials, textiles, ceramics, machinery, electronics, light industry, and metallurgy. Zibo's traditional products such as ceramics, glass, and silk have long been renowned. Nearly a hundred products, including ethylene, rubber, chemical fibers, chemical intermediates, pharmaceuticals, alumina, pesticides, water pumps, motors, abrasives, medical equipment, wall and floor tiles, denim fabrics, etc., hold important shares in the province and the country. High tech products such as new materials, fine chemicals, electronic information, and biomedicine are rapidly forming a scale.

By sorting out the pillar industries in Zibo City, it was

found that the industrial and construction industries have a unique advantage in the proportion of the city's industries, tax scale, and GDP. Among them, the industry is mainly composed of petrochemical and mechanical manufacturing industries, concentrated in the two major development areas of Qilu Chemical Industry Zone and Zibo Dongyue Economic Development Zone Maqiao Chemical Industry Park. Throughout the year, industrial enterprises above designated size achieved operating income of 603.74 billion yuan, an increase of 31.0%; Realized a profit of 39.25 billion yuan, an increase of 75.8%. 21 major industries in the city achieved year-on-year profit growth (or turning losses into profits), accounting for 53.8%, while the chemical industry achieved a profit of 24.92 billion yuan, an increase of 186.4%; The equipment manufacturing industry achieved a profit of 4.63 billion yuan, an increase of 19.3%; The total output value of the construction industry reached 121.55 billion yuan, an increase of 7.6%. In addition, logistics industry, high-tech industry, finance industry, and real estate industry are also the backbone of economic and social development.

## **2.2. Development of HT Port Area**

As an important public port operation area in Zibo City, HT Port Area mainly focuses on dry bulk cargo, liquid bulk cargo, and general cargo transportation, and actively develops container transportation business. It mainly provides raw material import and finished product export services for large enterprises in Huantai County, Zibo City, the southern region, and surrounding radiation areas. In recent years, it has mainly undertaken the functions of collection and distribution, transporting goods such as bauxite, iron ore, coal, industrial salt, limestone and cement for cement, mining and construction materials, chemicals, other goods, containers, etc.

## **3. Lessons Learned from Each Development Model**

### **3.1. Combined port development model - Japan's port industry**

Japan's port industry belt has gathered 6 world-class ports, but the ports have not restricted each other due to accelerating their own development. Instead of fierce competition, they give full play to their location characteristics and coordinate the division of labor with each other to form a multi-functional port economic system and enhance the competitiveness of the entire economic region [3]. In this regard, it is not difficult to see that the functional division of labor, mutual promotion, and coordinated development of the port clusters in Japan's port-facing industrial belt are due to the different historical and realistic conditions of each port, which determine the differences in the economic development foundation and functional positioning of the ports. On the other hand, thanks to the rational management strategy of the Japanese government, the division of labor and integration of various ports have solved the problem of overlapping functions between port development and avoided the adverse situation of malicious competition under limited resources.

### **3.2. Hinterland-supported development model—Port of Rotterdam**

Rotterdam is the most important industrial center, transportation hub and trade center in the Netherlands. Its port

economic contribution accounts for 12% of the country's GDP and 40% of the city of Rotterdam. It is a typical port city that "results from the port and interacts with the port" [4]. Thanks to the development of the Port of Rotterdam, at the beginning of its development, the port relied on the shipping and logistics industry to continuously transport iron ore, coal and other energy ores to the Eurasian continent. In addition, Rotterdam is an important industrial city in the Netherlands, with good industrial infrastructure and effective It has driven the clustered development of port-side industries, transforming the Port of Rotterdam from a transshipment port into a powerful comprehensive industrial complex in the region. Its unprecedentedly developed port-side industries and hinterland industry system have contributed greatly to port development and urban development. The total economic output of Rotterdam has led to the rapid development of service industries such as the financial industry, information industry, and insurance industry in Rotterdam. Rotterdam has also become a famous international cargo distribution center, financial center, and information center. Judging from the development history of the Port of Rotterdam, the port industrial economy, whether developed or not, has been gradually improved and expanded from the most basic port loading and unloading and logistics industries. As a typical port under the hinterland-supported development model, the Port of Rotterdam and the city of Rotterdam are intertwined and influence each other. The most inseparable thing is the extensive and deep road, rail and water transport system, which closely connects the port with surrounding industrial centers and jointly develops together. , and continue to realize the good wishes of sustainable economic development in the region.

### **3.3. Industrial cluster development model—Shanghai Port**

Shanghai Port is located at the forefront of the Yangtze River Delta and is an important hub port along China's coast. The development of Shanghai Lingang Industrial Zone mainly focuses on the manufacturing industry with the equipment industry as the core and the modern logistics service industry with international logistics as the core, and gradually promotes the agglomeration of related industry clusters. [5]. After several years of development and transformation, five distinctive industrial clusters have gradually formed, including engineering equipment manufacturing, shipping logistics services, finance and insurance, and passenger transportation. The representative areas are Shanghai Huangpu District and Lujiazui Financial Service Zone, which develop shipping finance and maritime law. A series of industries such as services, information consulting, and intermediary organizations; Hongkou North Bund area develops shipping organizations, shipping transactions, ship manufacturing and other industries; Waigaoqiao Free Trade Zone is positioned as a comprehensive bonded zone, forming an agglomeration effect in modern logistics and manufacturing; Lingang The new city will create a unique service industry cluster featuring marine culture.

From the perspective of the development of Shanghai's port industry, under the industrial cluster development model, the port industry has gradually shifted from manufacturing to the service industry. Modern service industries account for a large proportion, mainly including legal, financial, information and other industries and outsourcing separated from modern

developed enterprises. Service functions, various characteristic industrial clusters can often share production factors with each other, complement the shortcomings and disadvantages of enterprises and industries, and stimulate greater production momentum. Therefore, each industry in the cluster can be affected by the dual economic scale and economic development within and outside the cluster effect.

### **3.4. Port-city integrated development model - Tianjin Port**

Tianjin Port is located at the estuary of the lower reaches of the Hai River and in the west of the Bohai Bay. It is the maritime gateway for northern cities such as Beijing and Tianjin. Since 2006, Tianjin Lingang Economic Zone has actively built a northern heavy equipment manufacturing industry cluster and strived to achieve the goal of integrated port and industry development. In the cultivation and construction of equipment manufacturing clusters, Tianjin Port District has vigorously focused on ship equipment manufacturing As the leading industry of marine engineering and offshore engineering, the external diffraction manufacturing industry chain has formed a strong equipment manufacturing industry cluster [6].

Relying on local manufacturers and various scientific research institutions, the city has formed upstream and downstream industry supporting enterprises in the Lingang Industrial Park, and has developed an integrated industry-university-research development idea based on institutional research, industrial manufacturing, and the port area. In today's era, the main driving force for the growth of port-side industries has shifted from traditional heavy industrial manufacturing to advanced manufacturing with higher technological content. Throughout the development history of Tianjin Port Area, under the port-city integrated development model, the port industrial zone can, on the one hand, encourage enterprises to increase scientific research strength and investment in R&D to achieve iterative upgrading of the industry.

On the other hand, it is necessary to give full play to the pillar role of "high-precision" professionals from scientific research institutions and industries in overcoming difficulties in the industry, and encourage enterprises, schools and R&D institutions to overcome difficulties and grow simultaneously.

After comparing the above four types of development models, it was found that Japan's combined port development model, Rotterdam's hinterland support development model, Shanghai's industrial cluster development model and Tianjin's port-city integrated development model are all relatively mature port-side industrial parks. There is a lot of common experience in the construction, development and operation process, which has important guidance and reference significance for the future development model selection of Huantai Port District Lingang Industrial Park.

## **4. Inspiration to the Development of HT Ports**

The development model of inland river port industrial parks is a complex operating system, which includes ports, port cities, economic hinterlands, port industries, comprehensive transportation, etc., through the above This article continuously compares the development models of typical port-facing industrial parks at home and abroad, and combines the actual development of port-facing industrial

parks in HT Port Area with the industrial structure of Zibo City. We find that the foundation of the development of inland port-facing industrial parks is the port, and the pillar is the urban hinterland. Zibo City It can provide a strong economic foundation and industrial support for the development of the port. This is in line with the initial development stage under the Rotterdam hinterland support development model. It is very difficult to rely solely on the active intervention of social capital in the development process, which requires the guidance and support of the government. , adopting a combined port development model similar to that of Japanese ports, allowing the government to participate in macro management, allowing each industry to develop independently, and actively introducing leading industries that are in line with Zibo's industrial foundation and structure, such as the chemical industry, machinery manufacturing, logistics and transportation, and construction. and the real estate industry, among others.

This article believes that the HT Port Area Lingang Industrial Park should adopt the concept of combined port development in management, form a management system with the government as the core and integrating enterprises, and guide the development model of characteristic industrial clusters. Specific manifestations include the following aspects:

### **4.1. Development in the form of combined ports**

HT inland river port areas have a series of problems such as small ports, narrow inland waterways, lack of funds and underdeveloped technology. Taking the development form of combined ports as a breakthrough for the development of HT inland river port industrial zones means changing the inherent development ideas. Here, we innovatively envision major industrial parks in cities in the economic hinterland as potential port-facing industries. On the one hand, we can increase the input of production factors and plan and construct land space in advance through the entry of enterprises and industries into the parks; On the other hand, using the mainland industrial park as a land port, taking into account road and rail transportation, will help guide the development of enterprises in the port area, play a role in boosting production capacity, and form a unified way to open up the relationship between upstream and downstream industries and expand the scale of the port. , a variety of inland river combination port brands, and join hands with regional industries to participate in domestic and foreign market competition, resulting in a good and orderly "fermentation" effect.

Therefore, the port-facing industry in the HT port area referred to in this article refers to the regional inland industrial park and port hinterland. It is not a simple port combination, but is dominated by the port-facing industry in the port area, supplemented by the "onshore port area" It has its own characteristics and main development direction.

### **4.2. A management model that is government-led and integrated with enterprises**

Whether it is the development of Shanghai Port industrial cluster or the integration of Rotterdam Port City, government participation can be seen in the process of port development. The development and cultivation of HT Port are also inseparable from the support and guidance of the government. At the same time, the HT Port area and its surrounding areas

are underdeveloped areas. The application of a government-led and enterprise-integrated management model can solve the problem of ineffective relationships among capital, human resources, and resources. The flow and production processes are relatively lagging behind, and the production capacity is highly polluted. Especially when it comes to the promotion of infrastructure and the construction and improvement of the collection and distribution system, government planning and institutional guarantees play a decisive role in the future development direction of the port.

With the government as the core, it is conducive to giving full play to government management and coordination functions, highlighting the initiative advantages and credit of investment promotion, building an important communication platform for internal and external connections in the region, and maximizing the use of local and Various production factors in the surrounding areas lay solid growth soil for the development of the park. Corporate management is supplemented to avoid excessive government interference in the market, to think outside the box, and to achieve normal product configuration and orderly development in accordance with market rules.

### 4.3. Spatial agglomeration of advantageous industries

Compared with surrounding areas, the industrial foundation around HT Port is profound. The industrial system presents a multi-level structure with the chemical industry and steel manufacturing industry as the main industry, and the service industry, catering industry, and construction industry as supplements. Therefore, in the process of port development, over-reliance on a single industrial structure should be avoided. On the basis of the existing port warehousing and logistics industry or loading and unloading industry, a diversified industrial pattern that "walks on many legs" and has various elements of the journey running in parallel should be adhered to. In each development period, we can see that due to the industrial agglomeration effect, in the early stage of the development of the port-facing industries in the HT Port Area, a large number of primary industries will gather around inland shipping and port loading and unloading, mainly bulk cargo and groceries, and generally port transportation, and agricultural and sideline products processing, with low technical content and low product added value. Of course, the future development model of the port industry in the HT Port Area must not be fragmented. In the model design, this article will focus on selecting several pillar industries, gradually integrating the advantageous industries, and cultivating economic growth poles, so as to produce scale effects and amplify the entire The comprehensive strength of

the industrial zone.

### 4.4. Create conditions to gather talents

The port system involves all aspects, and talents are the foundation and source of port development. In order to build an "industry-city-research" development system, Tianjin Port has formulated a series of recruitment plans to attract global R&D personnel, university professors, and overseas talents, and has set up special subsidy funds to encourage high-end talents to start businesses and find employment. In contrast, the lack of talent has become a shackle restricting the development of HT Port and surrounding areas. Therefore, in addition to introducing urgently needed talents from the outside, it is also necessary to fundamentally solve the problem of the shortage of high-end talents. Various measures need to be taken to increase Talent training and selection. On the one hand, relying on the cultivation of higher education institutions in the Zibo area, integrating existing educational resources, increasing investment in education, and cultivating comprehensive talents; on the other hand, increasing self-service training or recruitment efforts by enterprises to cultivate corporate cultural connotation, Cultivate leading talents within the industry, build a talent training management and control system, introduce international training institutions and lecturers, and support internal incubation.

## References

- [1] Wang R, Tan Q. Dynamic model of port throughput's influence on regional economy [J]. *Journal of coastal research*, 2019, 93(1): 811-816.
- [2] Wang Y, Wang N. The role of the port industry in China's national economy: An input-output analysis [J]. *Transport policy*, 2019, 78: 1-7.
- [3] Carpenter A, Lozano R, Sammalisto K, Astner L. Securing a port's future through circular economy: experiences from the port of Gavle in contributing to sustainability [J]. *Marine pollution bulletin*, 2018, 128: 539-547.
- [4] Cheng B. Promotive effect of port trade on the international economy considering the effect of industrial clusters [J]. *Journal of coastal research*. 2020, 106(1): 221-224.
- [5] Li X, Li G. Research on the driving force of the regional economy to the development of ocean port shipping based on multiple regression analysis [J]. *Journal of coastal research*, 2020, 111(1): 168-177.
- [6] Guo D, Hu P, Li F, et al. An empirical study on the impact of seaports on urban economic development based on VAR model: The Case of Shenzhen and Shenzhen Port in the Context of Industrial Transfer [J]. *Journal of coastal research*, 2020, 111(1): 204-208.