

# Research on the Development of Wenzhou Port in the Context of Regional Economy

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## Abstract

China's port construction has now entered a stable period in terms of quantity, but there are still a lot of discussions about the development mode of port areas. The development of port areas cannot be separated from the development of the regional economy. And the future development of ports and the regional economy has been a hot topic in academic circles. This paper takes Wenzhou Port as a case study and analyses three aspects, namely, the introduction of Wenzhou Port, the current development situation and the dilemma, to put forward opinions and summarize the future development of Wenzhou Port.

## Keywords

Port; Construction; Wenzhou Port; Development Path.

## 1. Introduction of Wenzhou Port

Wenzhou Port which is located in Wenzhou City, Zhejiang Province is situated in the south of Zhejiang Province, in the middle of the golden coastline of the southeast coast, and is one of the twenty-five major ports in China and an important national hub port in China. Wenzhou Port is adjacent to Shanghai Port and Zhoushan Port in the north, Fuzhou Port and Xiamen Port in the south, and Kaohsiung Port and Keelung Port in Taiwan in the southeast, and is the closest port to Taiwan ports in Zhejiang. It has 350 kilometres of coastline, belonging to the southern part of the Yangtze River Delta Economic Zone, Wenzhou Bay and Yueqing Bay in the south of Zhejiang Province.

According to the History of Wenzhou Port, as early as in the Warring States period, Wenzhou had the beginnings of a primitive port. During the Tang Dynasty, Chinese merchants opened up a direct route from the Japanese island of Jijia to Wenzhou. During the Qing Dynasty, Wenzhou's maritime trade was hindered due to the long-term "sea ban". In 1876, the Treaty of Yantai was signed and Wenzhou was opened up as a commercial port. In 1994, Wenzhou Port was listed as one of the 20 major hub ports in China.

According to the "Wenzhou Port Master Plan" jointly approved by the Ministry of Communications of the People's Republic of China and the Zhejiang Provincial Government, Wenzhou Port is planned as "one port and seven districts", including three core port districts such as Yueqing Bay, Zhuyuanao and Daimen Island, and four auxiliary port districts such as Oujiang, Rui'an, Pingyang and Cangnan. Since the "13th Five-Year Plan", development focus of the Wenzhou port is gradually transferred from the Oujiang Estuary to the sea with a total of 199 productive berths. 20 berths are above the 10,000-ton level and 7 berths are above 50,000 tons (also for 100,000 tons). In 2019, the comprehensive cargo throughput capacity reached 7039.30 million tons. In 2020, the container throughput of Wenzhou Port reached 1 million TEUs for the first time. In March of 2022, the port of Wenzhou will achieve direct shipping of sea-rail containers to the sea for the first time.

## **2. Current Development of Wenzhou Port**

### **2.1. Greater Progress has been Made in the Construction of Bonded Logistics Platforms**

Wenzhou City has given full play to the location advantages of Oujiang Port District and Yueqing Bay Port District. It has set up bonded logistics parks such as Wenzhou Comprehensive Free Trade Zone and Yueqing Bay Port District Bonded Logistics Centre (Type B), has given full play to its location and policy advantages and carried out bonded processing, bonded logistics, international procurement, international distribution and other services around electrical, footwear, clothing, automobile and motorcycle parts and pumps and valves, high-end equipment manufacturing and strategic emerging industries, etc. To build a cluster of export-oriented key projects and a bridgehead for a new plateau of opening-up, Wenzhou has provided a strong platform for high-level opening-up and high-quality development.

### **2.2. Initially Formed a Relatively Complete Range of Port Industry System**

During the "Thirteenth Five-Year Plan" period, Wenzhou City seized the opportunity of the construction of the Ningbo-Taizhou-Wenzhou harborfront industrial zone in Zhejiang Province, strengthened the investment of policies and funds, brought into play the advantages of the private economy, strengthened the cooperation among ports, banks and enterprises and promoted the clustering of harborfront industries. Initially, electrical industry clusters represented by Yuantai Electromechanical and Yinneng Electric, building materials industry clusters represented by Fengyuan Concrete and Haiyue Concrete, garment industry clusters represented by Huaheng Garment and Bolin Garment, ship equipment clusters represented by Jinchuan Ship, and energy and environmental protection industry clusters represented by Zenergy Power Plant and China Resources Power Plant.

### **2.3. A Harbourfront Industrial Platform with Oujiangkou as its Core Gradually Takes Shape**

Wenzhou port industry has initially formed a port industry pattern with Oujiangkou Industrial Cluster as the core, supported by Yueqing Bay Modern Port Industry Park and Longgang New City Industrial Cluster. Among them, Oujiangkou Industrial Cluster mainly includes Oujiangkou New Area Phase I, Yueqing Economic Development Zone Expansion Area, Yueqing Liubai New City, Dongtou large and small port industrial area, with electrical and electric, petrochemical building materials, ship equipment and other heavy industry as the leading. Yueqing Bay Modern Harbor Industrial Park is still in the preliminary stage of construction and has not yet formed a scale effect. The Longgang New City Industrial Cluster is dominated by light industries such as printing and textiles.

## **3. The Development Dilemma of Wenzhou Port**

### **3.1. The Development of Deep-water Port Areas and Deep-water Berths is Lagging Behind, Missing the Opportunity to Form a Regional Hub**

Wenzhou Port was one of the 20 main hub ports in the country identified by the Ministry of Transport in 1994 and one of the 25 major coastal ports in the country identified in 2004, which belonged to the top of the third rank at that time. However, under the development trend of rapid growth in transport volume and continuous enlargement of ships, other ports have accelerated their development towards seaports and large deep-water quay berths, while Wenzhou Port is still fixed within the Oujiang estuary and has not made timely decisions to shift its focus to build large deep-water berths to accommodate the enlargement of ships and enhance the regional hub function of the port.

### **3.2. Lag in the Construction of the Collection and Distribution System and Limitation in the Role of Deep-water Port Area**

Zhuyuanao port area, Yueqing Bay port area, the size of the door island port area of the collection and distribution system construction seriously lags behind the construction of berths. The planning of the collection and distribution of highways and railways are still under construction which has not yet formed an effective collection and distribution conditions and capacity protection. It greatly restricted the construction of deep-water berths throughput capacity, low transport costs and the advantages of the function of play, affecting the formation of large-scale productivity.

### **3.3. There are No Obvious Advantages Or Brands, and it Suffers from Serious Competition from Large Neighbouring Ports.**

According to the statistics of the main business volume of Wenzhou Customs District of Hangzhou Customs, 97.7% of the freight exported was exported through transshipment and regional customs clearance in 2021. Among the value of goods exported by enterprises in Wenzhou area, only 7.89% was exported at Wenzhou port while 92.11% was exported at other ports. A large number of cargoes were attracted away by the surrounding Ningbo port.

In the core port area, accelerate the Yueqing Bay port area C area a, C area 4 berth and A area two 100,000 tons berth construction. Relying on Yueqing Bay port and railway spur and undertaking Zhuangyuanao and oujiang port area coal transit transport function, establish regional bulk cargo hub status. Focusing on the implementation of the second phase of the Zhuyuanao port area project and Zhuyuanao port area 8#, 9# berth renovation and upgrading project, improve the port area 50,000 tons and 100,000 tons berth construction. Playing Zhuyuanao deep-water shoreline, deep-water channel and port advantages, focus on foreign trade container business to achieve the bulk cargo transport function to Yueqing Bay port area transfer. In the petrochemical port area of Damen Island, focus on the development of LNG, LPG and other liquid bulk storage and transportation services to accelerate the construction of the Wenzhou liquefied natural gas (LNG) receiving station project which supports wharf, Zhejiang Petroleum Wenzhou oil depot supporting wharf by building a large-scale and professional petrochemical base.

In the Oujiang port area, promote the functional adjustment of the Longwan operation area and gradually transfer the transport function of the Longwan operation area to the Yueqingwan port area and the Lingkun operation area. Integrate the scattered terminals for sand and cement along the Oujiang River, and start the construction of a supporting terminal for the western multimodal transport centre in Lucheng.

In terms of local port areas, optimize the layout of the port in Ruian port area, and gradually adjust the port area above the three bridges of Feiyun River to urban living and tourism shoreline. Promote Pingyang Aojiang operation area freight function out of the planning and construction of Xiwan operation area general wharf project. Plan to carry out Chongjiaao general pier project, Xiaguan operating area to Taiwan trade general pier project and other key projects.

## **4. The Path Selection of Development of Wenzhou Port**

How can the port and the industry integrate and progress together? How to develop the port and the city together? The Wenzhou port should take the "national coastal first-class port" as its goal, adhering to the "three wheel drive" of port upgrading, industry concentration and city development and focusing on the "three major constructions" of big port, big water transport and big logistics "four key projects" such as port terminals, waterways and anchorages, land

island transportation and intelligent port and navigation to promote the comprehensive optimization and leapfrog development of Wenzhou port and navigation.

#### **4.1. Create a "Large Port" with a Strong Multi-level Port Infrastructure System**

Under the requirement of integrated port operation in Zhejiang Province, the Wenzhou port needs to position the port area with differentiated functions, strengthen the infrastructure construction of the port area and further improve the overall spatial layout of "one main, two secondary and multiple modes".

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#### **4.2. Build a Modern Multimodal Transport System of "Big Transport"**

With economic development, it is becoming increasingly difficult for a single mode of transport to meet the huge demand for logistics. Multimodal transport is becoming the direction of development as a mode of transport with complementary advantages, improved efficiency and reduced costs. The Wenzhou port should continue to highlight the leading role of the port, coordinate the water, rail and public transport logistics network and form a multimodal transport hub node led by water transport.

Promote the construction of the Yueqing Bay railway branch line and its supporting facilities, solve the problem of the "last kilometre" of railway access to the port and realise the efficient connection between mainline railway transport and water transport. Coordinate with port operators, railway operators, cargo owners and other parties involved to provide "one-way" transport Encourage relevant enterprises to set up multimodal transport operators to carry out all kinds of intermodal transport business and create a demonstration project of sea-rail intermodal transport in Yueqing Bay. Carry out the construction of the lower shore port area and the rear comprehensive logistics base (multimodal transport centre) and accelerate the completion of the western multimodal transport hub of Lucheng. Strengthen the foreign trade container business and sea and river intermodal transport node function in Zhuangyuanao port

area and promote the port area 5#, 6# container berth construction to build Zhuangyuanao South Zhejiang coastal container hub port.

At the same time, encrypt the frequency of foreign trade routes, dock with Zhejiang Seaport Group and strive for policy support of foreign trade routes. Relying on the existing foreign trade business in Southeast Asia and Taiwan, moderately increase the frequency of Taiwan, Japan, South Korea and other East Asia, Southeast Asia near-ocean routes, vigorously develop container business and continue to expand the foreign trade market in Southeast Asia shipping. Efforts will be made to open up new ocean-going routes, build the brand of Wenzhou's foreign trade routes and expand the market along the "Belt and Road".

In addition, it will expand the functions of port logistics, accelerate the development of value-added logistics business and enhance the functions of bonded warehousing, value-added processing, trade services, financial services and shipping services in the port area. Large enterprises such as Jingdong Logistics and Sinotrans will be guided to set up warehouses in Wenzhou. And the landing process of Hong Kong Leke and Shanghai GLP in Yueqing Bay Logistics Park will be accelerated. Start the construction of Oujiangkou Lingang Logistics Center and Zhuangyuanao Lingang Logistics Park to create a large-scale integrated logistics park in Lingang.

#### **4.3. To form "Big Data" of Innovative Smart Port and Shipping System**

Right now, digitalization is becoming the "new engine" of the development of Wenzhou port. Wenzhou port needs to unify the port and shipping information standard, docking the information transmission standard of each transport system and major main platform of public, railway, sea and air transport, formulating the unified standard specification of Wenzhou port and shipping system, realizing the seamless connection between the port and shipping information system and the integrated service platform of the four ports and the big data centre of shipping on the sea silk road, providing comprehensive information enquiry, logistics tracking, port community service, ship planning management, ship scheduling management, terminal operation monitoring visualization management, mobile electronic payment and other information service functions. It will provide information service functions such as comprehensive information inquiry, logistics tracking, port community service, ship planning management, ship scheduling management, terminal operation monitoring and visualization management and mobile electronic payment.

Wenzhou Port should promote the construction of a port and shipping wisdom platform, integrate into the "four ports" linkage wisdom logistics cloud platform of Zhejiang Province, rely on the national logistics platform and the existing public-air-rail-sea multimodal information system of Jingdong Logistics and build the "four ports" multimodal transportation information platform of Wenzhou City. platform. Promote the construction of the data centre and application platform of the Wenzhou Port and Maritime Administration and implement the five major projects of intelligent information collection, data analysis and services, management and application of port and maritime business, intelligent analysis and early warning, and intelligent operation guarantee. Build a port and navigation Internet of Things (IoT) management platform and a sharing centre for port data and resource transactions and efficiently smooth the information interaction between ports and cargo owners, freight forwarders, transport companies, shipping companies, port supervision and other departments. Enhance the level of big data and intelligence in port and shipping, accelerate the application of emerging technologies such as drones, smart gates and 5G in ports and improve the intelligent control of key equipment such as port handling equipment, transport vehicles and yard loading and unloading. Promote the full application of integrated container terminal operating systems in port areas such as Zhuyuanao and Yueqing Bay and accelerate the upgrading of automated and intelligent systems for bulk cargo terminals. Promote the application of high-definition

remote sensing technology in the port and navigation business system by using high-resolution remote sensing image human-computer interaction interpretation means to identify and extract cross-river bridge information, channel information, terminal information and yard information.

## 5. Conclusion

Ports are the transport hubs of coastal cities. The port promotes the development of the city and the development of the city promotes the development of the port. During the 14th Five-Year Plan development period, Wenzhou should seize the "One Belt, One Road" , "Yangtze River Economic Belt" strategies and the major opportunity of integrating the province's coastal ports to implement integrated development in Zhejiang Province and build a regional seaport hub. Promote the development of the marine economy with port development and support Wenzhou to become an important central city along the southeast coast.

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## References

- [1] CONG L, ZHANG D, WANG M, et al:The role of ports in the economic development of port cities: panel evidence from China, *Journal of Transport Policy*,Vol. 90 (2020), p.13-21.
- [2] SAKALAYEN Q, CHEN P S L, CAHOON S. The strategic role of ports in regional development: Conceptualising the experience from Australia , *Journal of Maritime Policy & Management*,Vol. 44 (2017) No.8,p. 933-955.
- [3] CARDENETE M A, LOPEZ - CABACO R: Economic and environmental impact of the new Mediterranean Rail Corridor in Andalusia: A dynamic CGE approach,*Journal of Transport Policy*, Vol. 102 (2021), p.25-34.
- [4] ALVAREZ - SANJAIME O, CANTOS - SANCHEZ P, MONER - COLONQUES R, et al: The impact on port competition of the integration of port and inland transport services, *Journal of Transportation Research Part B: Methodological*,Vol. 80 (2015), p. 291-302.
- [5] YOCHUM G R, AGARWAL V B:Economic impact of a port on a regional economy: Note ,*Journal of Growth and Change*,Vol. 18(1987) No.3,p.74-87.
- [6] YOCHUM G R, AGARWAL V B:Static and changing port economic impacts,*Journal of Maritime Policy & Management*, Vol. 15(1988) No.2,p.157-171.