

Original Paper

Research on the Construction Path of the Qiongzhou Strait-Beibu Gulf Bay Area

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Abstract

The Beibu Gulf port cities (Qinzhou, Fangchenggang, and Beibu Gulf), Zhanjiang, and the Hainan Free Trade Port are separated yet connected by the waters of the Beibu Gulf. The three regions across the two shores all possess natural excellent ports and similar customs and cultures, thereby enjoying a natural advantage for regional integration. However, currently, Zhanjiang primarily serves the “Pan-Pearl Triangle 9+2”; the Hainan Free Trade Port advocates the Qiongzhou Strait integration strategy; and the Beibu Gulf port cities focus on the Western Land-Sea New Channel. Consequently, the dimension, depth, and intensity of cooperation among the three have not advanced further. This paper first reviews previous research achievements, then summarizes and analyzes the development status of the cities in the three regions across the two shores to identify the breakthroughs for their further cooperation, delineates the significance and necessity of tripartite cooperation, and finally proposes measures for constructing the Qiongzhou Strait-Beibu Gulf Bay Area.

Keywords

Beibu Gulf, the Qiongzhou Strait, the Qiongzhou Strait-Beibu Gulf Bay Area

1. Introduction

On March 30, 2026, the Hainan Free Trade Port promulgated six major policy measures (liberalization and facilitation of trade, liberalization and facilitation of investment, liberalization and facilitation of cross-border capital flows, liberalization and facilitation of people’s entry and exit, liberalization and facilitation of transportation, and secure and orderly flow of data), marking a new stage after the independent customs operations of the entire Hainan Island. These six policy measures will also boost the morale and confidence in the high-quality development of both shores of the Qiongzhou Strait and

the Beibu Gulf port cities (Qinzhou, Fangchenggang, and Beibu Gulf; hereinafter these three cities are referred to as “Beibu Gulf port cities”). Shipping vessels travel frequently between the Beibu Gulf ports and both shores of the Qiongzhou Strait, and the cultures of the three regions across the two shores are convergent, endowing them with a natural advantage for regional cooperative integration. However, due to the different development focuses of the provincial governments of the three regions across the two shores, they have failed to further strengthen cooperation. This paper will attempt to further delve into and summarize the necessity, significance, and restrictive factors of strengthening cooperation among the three regions across the two shores, and provide measures for constructing the Qiongzhou Strait-Beibu Gulf Bay Area.

2. Current Research Status on Regional Linkage and Coordinated Development Between Both Shores of the Qiongzhou Strait and the Beibu Gulf Region

According to existing literature, most scholars take the linkage between both shores of the Qiongzhou Strait or between the Beibu Gulf ports and the Greater Bay Area as their primary research objects, while there is relatively little research on the linkage development or coordinated development between both shores of the Qiongzhou Strait and the Beibu Gulf.

Pei and Zhang (2026) placed the linkage development between the Hainan Free Trade Port (FTP) and the Greater Bay Area under the framework of “digital-real economy integration,” pointing out that the two are not isolated strategic units but need to form a national strategic synergetic entity through the deep integration of the digital and real economies; they identified five major challenges—innovation deficit, industrial imbalance, decoupling of green practices, institutional barriers, and data governance gaps—and proposed five corresponding sets of policy paths. Mo et al. (2026), based on the locational characteristics of Guangxi connecting with the Greater Bay Area, supplemented the research shortcomings of Beibu Gulf linkage from the subdivided field of rural industrial digitization, stepping out of the traditional scope of ports and macroeconomic research, taking the digital countryside as a starting point to construct the “12345” architecture and five major cluster development modes of Guangxi’s digital countryside, anchoring the agricultural product supply assurance of the Greater Bay Area, border trade digitization, and land-sea industrial linkage, opening up the Greater Bay Area-Guangxi rural industrial chain synergy channel, and indirectly improving the industrial landing paths of the Beibu Gulf hinterland with the Qiongzhou Strait and the Greater Bay Area, thereby filling the research gap regarding the micro-level landing of regional linkage in counties and villages.

There are also many scholars who take the Hainan Free Trade Port’s connection and deep cooperation with ASEAN as their research background. Huang et al. (2023), based on four premises—that the policy dividends of the free trade port can be effectively transformed into practical support for regional cooperation in the cruise industry; that the locational and policy advantages of the Hainan Free Trade Port can support its development into a regional cruise hub; that environmental protection demands will continuously serve as the core orientation for the development of the cruise industry; and that the

growth potential of the regional tourism market is exploitable—conducted a SWOT analysis on the cruise tourism industry between the Hainan Free Trade Port and the ten ASEAN countries, finding that their cooperation possesses the following advantages: multiple policy foundations, a huge market potential under cooperation, and multiple favorable conditions such as resource endowment, location, interconnectivity, and environmental protection compatibility; however, there are also problems such as imbalanced development of regional infrastructure, insufficient visa facilitation, the entire industrial chain being in its initial stage of development, and generally high port taxes and fees in China. Therefore, the authors proposed that RCEP tariff reductions can significantly reduce the import costs of the cruise industry, and that the continuous growth of regional tourism, green environmental protection trends, and post-pandemic upgrades of Chinese cruise products and the upward extension of the industrial chain all bring new opportunities. Peng and Huang (2023), based on their research results, believe that the Hainan Free Trade Port needs to strengthen cooperation through a three-dimensional path of “conceptual openness, institutional openness, and industrial openness.” Specific countermeasures include: upholding the concept of a South China Sea community with a shared future; promoting integrated institutional innovation to comprehensively align with high-standard international economic and trade rules; and exploring the construction of a “Circum-South China Sea Regional Economic Cooperation Circle” with a key focus on promoting the cross-border development of “four major characteristic industries.” Zhang (2022), under the background of the global entry into the digital technology revolution, explored how the digital economy can become a new engine for the linkage between Hainan and ASEAN. The scholar believes that both sides of the Hainan Free Trade Port and ASEAN countries should make every effort to build a “dual-wheel driven” cooperation mode of “industrial digitization” and “digital industrialization” aiming at climbing to the high end of the global value chain. Policy strategies include: accelerating the construction of digital trade cooperation mechanisms, optimizing digital industry division and collaboration modes, and deeply expanding the digital innovation integration and development at the enterprise level to break through core foundational technologies. Liu (2022) pointed out that Hainan suffers from a significant “low wage vs. high housing prices and high commodity prices” inversion contradiction. Taking data as an example, as non-first-tier cities, Sanya and Haikou have soaring housing prices, whereas the average housing prices in new first-tier cities such as Changsha are very affordable; driven by the tourism industry, the prices of livelihood materials such as vegetables and meat in Hainan are often 3 to 4 times higher than those in the mainland. This high living pressure directly leads to the embarrassing pain point of the free trade port being “unable to attract and retain talents.” In addition, problems such as a weak industrial foundation, few enterprises, and monotonous employment opportunities are also very prominent. The author proposed four measures: first, to address the severe “three rural issues,” rural revitalization and tropical agricultural modernization must be advanced to increase farmers’ income through “agriculture + tourism”; second, the government must strengthen macroeconomic regulation of real estate and strictly execute policies such as purchase and loan restrictions to maintain continuity; third, accelerate

the introduction of new policies for talent housing and living support to fundamentally lower the barriers to housing purchase and living; fourth, fully utilize the structural differences within ASEAN countries to develop matching characteristic industrial bases. Dong and Hao (2021) discussed that the construction of the Hainan Free Trade Port requires strong industrial support, and raised questions regarding the realistic foundation for industrial linkage between Hainan and ASEAN countries, and how to precisely select key fields of linkage to avoid homogeneous competition. The study found that: 1. Hainan and ASEAN possess natural factor complementarity—the Hainan Free Trade Port primarily focuses on developing producer services, while most ASEAN countries focus on developing processing and manufacturing industries; 2. Hainan possesses high-tech carriers such as the Haikou National High-Tech Industrial Development Zone and the Sanya Yazhou Bay Science and Technology City, which provide the foundational conditions for misaligned synergy. The authors proposed two main paths: first, to build industrial parks together to form an agglomeration effect by improving cross-border interconnectivity infrastructure such as ports and airports; second, to fully utilize comparative advantages to empower ASEAN's industries with Hainan's producer services. Concurrently, differentiated strategies should be adopted for the different industrial statuses of ASEAN countries (such as strengthening linkage with Malaysia and Vietnam in terms of manufacturing OEM). Currently, scholars generally agree in their articles that the successful construction of the Hainan Free Trade Port depends on multi-level and multi-dimensional regional linkage to efficiently connect with both domestic and international markets and resources, thereby transforming policy advantages into development advantages. However, existing research achievements have not deeply explored how the Hainan Free Trade Port plus the Beibu Gulf Bay Area should design a set of risk control rules that both promote the free cross-border flow of data and safeguard national security and individual privacy when connecting with ASEAN. A few studies have also pointed out that excessive or disorderly regional linkage may weaken the unique policy advantages of the Hainan Free Trade Port and blur external perceptions of its strategic positioning.

Some scholars have also conducted research on the topic of how to achieve coordinated development in the Qiongzhou Strait. Liu et al. (2018) and the Haikou Municipal Social Science Federation Project Team (2019) took the massive stranding of vehicles and passengers due to heavy fog in the Qiongzhou Strait in 2018 as a realistic breakthrough point, based on the initial policy background of the Hainan Free Trade Port, anchored the difficult problem of cross-administrative-region collaboration between Hainan and Guangdong (Haikou-Zhanjiang), and analyzed the development bottlenecks of the strait from four layers: port and shipping operations, administrative barriers, infrastructure, and industrial collaboration; they implemented layered strategies for the short, medium, and long term, optimizing ferry scheduling and smart port reservations in the short term, restructuring port and shipping enterprises relying on the capital market and exploring the lease and entrustment management model of Xuwen Port in the medium term, and look forward to the planning of the Qiongzhou Strait cross-sea passage in the long term; meanwhile, stepping out of a single strait perspective, they proposed to

connect the Qiongzhou Strait Economic Belt with national strategies such as the Belt and Road Initiative, the Pan-Pearl River Delta, and the South China Sea development, elevating the Haikou-Zhanjiang cooperation to the provincial or even national overall planning level. However, Liu et al. (2018) focused more on quantifying port transport capacity, shipping entity data, and practical countermeasures, while the Haikou Municipal Social Science Federation Project Team (2019) focused on macro-strategic positioning, cultural synergy, and ideas for cross-provincial administrative division adjustments. Xu (2026), under the new background of preparing for the independent customs operations of the Hainan Free Trade Port, broke through previous research confined to the two places of Hainan and Zhanjiang, incorporated Hainan, Western Guangdong (Zhanjiang, Maoming, Yangjiang), and Guangxi Beibu Gulf (Qinzhou City, Beibu Gulf City, and Fangchenggang City) into a unified analytical framework, summarized five major bottlenecks in regional cooperation: physical transportation, administrative mechanisms, industrial isomorphism, market fragmentation, and public service imbalance, innovatively constructed a three-dimensional cooperation mechanism of “co-construction, sharing, and co-bearing,” matched it with landing institutions such as cross-provincial councils, incremental tax sharing, regional coordinated development funds, and collaborative legislation, and designed an all-dimensional landing path encompassing transport infrastructure, industrial misaligned layout, factor marketization, and public service integration.

Overall, the research directions of scholars dynamically deduce the incorporation of the Hainan Free Trade Port into complex macro-international relations such as the RCEP, geopolitical media political ecology, and the South China Sea community with a shared future. There is a lack of research achievements by scholars in the field of further policy mutual benefits, resource integration and development, and industrial configuration optimization between both shores of the Qiongzhou Strait and the Beibu Gulf ports.

3. Current Development Status and Bottlenecks of Cities Between Both Shores of the Qiongzhou Strait and the Beibu Gulf Region

3.1 Policy Aspect

Cities on both shores of the Qiongzhou Strait and Beibu Gulf port cities all possess coastal locational advantages, but they have different positionings and serve different national strategies, with each city exhibiting its own unique development characteristics.

According to the “15th Five-Year” Plan Outline issued by the Hainan Provincial Government, Hainan Province bases itself on the national strategic positioning of a free trade port, aims to continuously construct the free trade port with high standards in the future, improve the level of trade and investment liberalization and facilitation, and establish an internationally competitive tax system; internally, it deeply integrates into national major regional strategic frameworks, linking and developing more closely and synergistically with regions such as the Greater Bay Area, Beijing-Tianjin-Hebei, and the Yangtze River Delta; externally, it accelerates the construction of the international shipping hub of the

Western Land-Sea New Channel, implements the “dual-directional dual-hub port” strategy, advances the construction of sister ports along the “Belt and Road” such as Yangpu Port and Abu Dhabi Port, and expands direct, transit, and ocean routes.

According to the 2026 Zhanjiang Municipal Government Work Report, Zhanjiang City is geographically the supporting point for the linked development of the Area and the Hainan Free Trade Port, and will focus on leveraging its own role as a bond to build a world-class coastal industrial base. At the same time, leveraging its own locational and port advantages, it actively cooperates with “Belt and Road” countries, aiming to build a higher-level open regional economic entity in the future. In addition, based on characteristic tropical agriculture, it develops and strengthens modern characteristic agriculture to create a 10-billion-level agricultural cluster.

According to Beibu Gulf construction policy documents, the Beibu Gulf port cities (this article uses Beihai City, Fangchenggang City, and Qinzhou City as the Beibu Gulf port cities) will be built into a general pattern of “one port, three domains, five cores, five zones, and multiple port points” to implement the Western Land-Sea New Channel strategy. Concurrently, they accelerate alignment with the Hainan Free Trade Port, with major initiatives including optimizing port resource allocation, further increasing port construction, completing the Qinzhou East Fairway and Fangchenggang 300,000-ton fairway, and expanding port cargo throughput; optimizing shipping networks, densifying domestic trade lines, expanding ASEAN near-sea lines, cultivating European and American ocean routes, and creating an international hub seaport; completing the Beihai International Cruise Homeport, opening cruise routes to Vietnam and Southeast Asia, expanding international cruise and tourist transport capacity, and promoting the cruise and yacht industry.

3.2 Industrial Aspect

Table 1. 2024 Industrial Output (100 million RMB)

Industry	Beibu Gulf Port Cities (Fangchenggang, Beihai, and Qinzhou)	Zhanjiang	Hainan
Primary Industry	816.3552	733.873	1627.63
Secondary Industry	2167.581	1237.2387	1497.92
Tertiary Industry	1950.6149	1868.82	4810.14

Table 2. Share of Industries in 2024

Industry Proportion in 2024	Beibu Gulf Port Cities (Fangchenggang, Beihai, and Qinzhou)	Zhanjiang	Hainan
<i>Primary Industry</i>	17%	19%	21%
<i>Secondary Industry</i>	44%	32%	19%
<i>Tertiary Industry</i>	40%	49%	61%

Data Sources: Guangxi Statistical Yearbook, Zhanjiang Statistical Yearbook, Hainan Statistical Yearbook, and Statistical Bulletins.

According to the Table 1 and Table 2, the Beibu Gulf port cities in 2024 took the secondary and tertiary industries as their main industries, with the share of the secondary industry being greater than that of the primary and tertiary industries, and in terms of growth rate, the primary industry was greater than the secondary and tertiary industries. According to the document “Notice on Several Policies for Promoting the High-Level Openness and High-Quality Development of the Guangxi Beibu Gulf Economic Zone in the New Era,” relying on port advantages, the Beibu Gulf port cities take port shipping and logistics transport, heavy chemical industry, financial smelting, and grain and oil processing as their main pillar industries.

Zhanjiang takes the secondary and tertiary industries as its main industries, with the tertiary industry accounting for a relatively large share, but the gap between the shares of the secondary and tertiary industries is not large. In terms of growth rate, the primary industry leads the secondary and tertiary industries, and the growth rate of the secondary industry is negative, indicating that the secondary industry is in a state of slight decline compared with the same period. According to the 2026 Zhanjiang Municipal Government Work Report, Zhanjiang’s current main industries are steel, petrochemicals and energy, and modern agriculture and food industries.

In Hainan, the primary and tertiary industries account for a large proportion, among which the share of the tertiary industry is 61%, which is the largest, and the share of the secondary industry is 19%, which is the lowest. In terms of growth rate, the primary industry ranks first, followed closely by the tertiary industry, and the secondary industry ranks last. According to the Hainan “15th Five-Year” Plan Outline, Hainan makes every effort to develop a free trade port economy dominated by tourism and modern services, taking tourism, modern services, high-efficiency tropical characteristic agriculture, and high-tech industries as its four pillar industries to construct the Hainan Free Trade Port with high standards.

In the horizontal comparison of the same period, the proportion of Hainan's tertiary industry is higher than that of Zhanjiang and the Beibu Gulf port cities, the proportion of its secondary industry is lower than that of Zhanjiang and the Beibu Gulf port cities, and the proportion of the secondary industry in the Beibu Gulf port cities ranks first among the three. Relying on ASEAN and closely cooperating with maritime "Belt and Road" countries, the development of the tertiary industry in the Beibu Gulf port cities has been promoted, and the growth rate of their tertiary industry is greater than that of Zhanjiang and Hainan.

In summary, Hainan, the Beibu Gulf port cities, and Zhanjiang have different overall industrial structures and different future social industrial development directions. Cooperation among Hainan, the Beibu Gulf port cities, and Zhanjiang in terms of industry needs to be strengthened and deepened.

3.3 Shipping

As can be seen from the figure, the number of vessels in the Qiongzhou Strait and the Beibu Gulf is relatively large, and the fairways are busy. If the Qiongzhou Strait and the Beibu Gulf bay strengthen shipping cooperation, fairway cooperation, and deep cooperation in the tourism industry, it can promote the economic development of the five cities of Hainan, Zhanjiang, Beibu Gulf, Qinzhou, and Fangchenggang.

Table 3. Port Throughput

Port	Throughput (10,000 tons)	Beibu Gulf Port Cities (Fangchenggang, Beihai, and Qinzhou)	Zhanjiang	Hainan
2024		44869.21	27500	23220.23
2023		44002.84	25376	20046
2022		37133.93	28273	18806

Table 4. Port Throughput Growth Rate

Port	Throughput Growth Rate	Beibu Gulf Port Cities (Fangchenggang, Beihai, and Qinzhou)	Zhanjiang	Hainan
2024		2%	8%	16%
2023		18%	-10%	7%

Data Sources: *Guangxi Statistical Yearbook, Zhanjiang Statistical Yearbook, Hainan Statistical*

Yearbook, and Statistical Bulletins.

As can be seen in Table 3 and Table 4, The port throughput of the Beibu Gulf port cities is large, but its growth rate has declined, though overall the growth speed is fast. Zhanjiang experienced a 10% decline in 2023 and an 8% increase in 2024, showing a downward trend in the past two years. Hainan's port throughput has grown continuously and at a relatively fast rate, with its annual throughput absolute value approaching that of Zhanjiang.

3.4 Natural Resources

The coastal sea-area cities of both shores of the Qiongzhou Strait and the Beibu Gulf ports are rich in mineral resources, which can form resource complementation. Their marine resources are abundant, marine industries exhibit a certain degree of competitiveness, and Hainan significantly leads other cities in tourism resources.

The Beibu Gulf port cities are rich in mineral resources and marine fishery resources; Beihai City is rich in tourism resources, followed by Fangchenggang City, while Qinzhou City has relatively fewer tourism resources.

Qinzhou City has discovered 46 kinds of minerals, with a total of 176 deposits and mineral spots, including one medium-sized lead-zinc deposit and one rare earth deposit. The main mineral types that have been developed and utilized include lead-zinc ore, coal, manganese ore (manganese oxide), ceramic clay, gypsum ore, titanium-iron sand ore, limestone, granite, and construction sand. In terms of marine resources, Qinzhou possesses the Maowei Sea with an area of 135 square kilometers, which is the largest natural oyster seedling collection and artificial cultivation base in South China, producing the four famous products: large oysters, mud crabs, penaeid shrimps, and groupers.

In terms of mineral resources, Fangchenggang City has verified 48 types of minerals across 117 mineral sites, including 7 large deposits, 17 medium deposits, and 77 small deposits, primarily consisting of sand, stone, and clay mines. The Nagu granite mine for construction use in Nalian Village, Fangchenggang City, was rated as an autonomous region-level green mine. In terms of marine resources, Fangchenggang City enjoys good seawater quality and possesses coastal tourism attractions such as the Jingdao Scenic Area, a national 4A-level scenic spot.

In terms of mineral resources, Beihai City has discovered 47 types of minerals, accounting for 33% of the discovered minerals in Guangxi, with 26 large deposits and 10 medium deposits. Its retained resource reserves of kaolin and natural quartz sand rank first in Guangxi. In terms of marine resources, Beihai City is rich in fishery resources, with large yields of squid, cuttlefish, sharks, groupers, and shrimps. Marine medicinal organisms mainly include Chinese horseshoe crabs, sea snakes, pipefish, and seahorses. The city has abundant tourism resources, with 1 AAAAA-level scenic spot and 17 A4-level scenic spots.

Zhanjiang, in terms of marine resources, accounts for 2/3 of China's total marine pearl production, and its shrimp farming production accounts for approximately 1/4 of China's total. Its main marine

economic products include golden pompano, shrimp, oysters, groupers, Babylon snails, jellyfish, etc. Concurrently, Zhanjiang is crowned with the title of “Capital of China’s Aquatic Prepared Dishes,” with an annual production of 100,000 tons and an annual output value reaching 5.5 billion RMB in 2022. In terms of mineral resources, Zhanjiang City has discovered 42 types of minerals, accounting for 28.38% of the 148 types discovered in Guangdong Province, across 337 mineral sites, including 92 large and medium-sized mineral sites; its dominant minerals include coastal rare and rare earth sand ore, glass sand, silver ore, crystal, kaolin, peat, and diatomite. The proven reserves of kaolin mineral resources are 90.52 million tons, with prospective reserves exceeding 250 million tons; the geological reserves of diatomite are nearly 70 million tons. In terms of tourism resources, it has 6 A4-level scenic spots, and tourism resources are relatively scarce.

Hainan possesses rich marine resources, with more than 800 types of marine aquatic products, including over 600 species of fish, and more than 40 types of major marine economic fishes. There are two sea salt fields in Hainan, with an annual salt production of about 40,000 tons. Hainan is known as a “natural medicine storehouse,” with more than 30 main varieties of southern medicines cultivated. In terms of mineral resources, 89 types of various minerals have been discovered, primarily dominated by glass sand, zircon sand ore, ilmenite sand ore, and rich iron ore. There are 25 glass sand mineral sites, including 16 large ones; 20 zircon sand mineral sites, including 3 large ones; 21 proven ilmenite sand mineral sites, including 1 large one; and the retained resource reserves of rich iron ore are 249 million tons. Tourism resources are abundant and highly characteristic, with 7 AAAAA-level scenic spots and 42 A4-level scenic spots.

3.5 Population and Social Humanities

Table 5. Permanent Resident Population (10,000 people)

Year	Beibu Gulf Port Cities	Zhanjiang	Hainan
2024	631.38	712.08	1048.31
2023	627.37	707.84	1043.21
2022	625.82	703.54	1027.02

Table 6. Population Growth Rate

Year	Beibu Gulf Port Cities	Zhanjiang	Hainan
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Year	Beibu Gulf Port Cities	Zhanjiang	Hainan
2024	0.64%	0.60%	0.49%
2023	0.25%	0.61%	1.58%

Data Sources: Guangxi Statistical Yearbook, Zhanjiang Statistical Yearbook, Hainan Statistical Yearbook, and Statistical Bulletins.

As can be seen from Table 5 and Table 6, the permanent resident population of Hainan has surpassed ten million, with the number rising gradually. The total growth rate over the past two years is greater than that of Zhanjiang and the Beibu Gulf port cities, especially with a larger growth rate in 2023. This chart indirectly demonstrates that under the influence of the Hainan Free Trade Port policies, the dividends of the free trade port talent introduction policies, and the opportunities brought by the free trade port construction, people are more willing to choose Hainan to reside and work. The continuous increase in the permanent resident population will also bring new development opportunities to Hainan.

Table 7. Permanent Resident Population Comparison (10,000 people)

Year	Beibu Gulf Port Cities	Zhanjiang	Haikou Economic Circle
2024	708.93	712.08	465.22
2023	707.21	707.84	462.05
2022	706.14	703.54	455.56

Table 8. Population Growth Rate Comparison

Year	Beibu Gulf Port Cities	Zhanjiang	Haikou Economic Circle
2024	0.64%	0.60%	0.69%
2023	0.25%	0.61%	1.42%

Data Sources: Guangxi Statistical Yearbook, Zhanjiang Statistical Yearbook, Hainan Statistical Yearbook, and Statistical Bulletins.

Since the Qiongzhou Strait separates the Haikou Economic Belt from Zhanjiang, and the Haikou Economic Circle is also separated from the Beibu Gulf by the sea, extracting the population data of the Haikou Economic Circle (Haikou, Wenchang, Chengmai, Ding'an, and Tunchang) for comparison is more consistent with the description of the Qiongzhou Strait port cities and Beibu Gulf port cities. It can be seen from the Table 7 and Table 8 that the population growth trend of the Haikou Economic Circle is similar to that of Hainan's population. The population of the Haikou Economic Circle increases continuously, and its total growth rate over the two years is greater than that of the Beibu Gulf port cities and Zhanjiang City. Through the permanent resident population and permanent resident population growth rate tables, it can be observed that the inflow volume and inflow speed of the permanent resident population in the Haikou Economic Circle are greater than those of the Beibu Gulf ports, and the inflow speed of the Haikou Economic Circle is greater than that of Zhanjiang. Among the Qiongzhou Strait port cities and Beibu Gulf port cities, the Haikou Economic Circle has become the urban belt that people are more willing to choose for residence.

In terms of society and humanities, the urban areas of both shores of the Qiongzhou Strait and the Beibu Gulf region have been influenced by Lingnan culture for many years, with similar social customs and convergent dietary preferences. People colloquially refer to the relationship among Guangxi, Guangdong, and Hainan as the "South China F3," which sufficiently proves the nearly identical cultural characteristics, folk customs, and habits of the three southern provinces. Commercial culture is similarly influenced by Cantonese merchant culture, emphasizing concepts such as integrity and win-win cooperation. Therefore, the cities on both shores of the Qiongzhou Strait and the Beibu Gulf port cities face little resistance in regional coordination and deep industrial cooperation. If they can integrate and develop, the market prospects will be vast.

3.6 Development Bottlenecks of Beibu Gulf Port Cities, Zhanjiang, and Hainan Free Trade Port

Analyzed from the perspective of industrial structure, the development of the Hainan Free Trade Port exhibits a high dependence on the tertiary industry and a weak foundation in the secondary industry. At a time when Hainan's tax revenue still relies heavily on central transfer payments, Hainan's promotion of industrial transformation toward high-tech fields faces multiple challenges such as long cycles, high difficulty, complex links, and exorbitant costs. Because Zhanjiang is geographically far from the two major economic growth poles within Guangdong Province—the Guangzhou Economic Circle and the Pearl River Delta Economic Circle—although it possesses a certain industrial foundation, its development speed is relatively lagging, and its development is restricted due to the limited role of regional radiation and driving force, requiring the exploration of new paths for industrial transformation. The Beibu Gulf port cities have relatively complete industrial infrastructure; however, compared with the high-end manufacturing clusters in the Yangtze River Delta region, there is still a clear gap, and additionally, local economic development is prone to fluctuations due to geopolitical factors, making the transformation and upgrading of the industrial structure urgent.

4. Necessity of Constructing Cooperation Between Both Shores of the Qiongzhou Strait and the Beibu Gulf Region

4.1 Better and Superior Service to the Western Land-Sea New Channel Strategy and the “Belt and Road” Strategy

As a national-level logistics artery strategy, the core of the Western Land-Sea New Channel strategy lies in improving the flow efficiency of materials and personnel between the western hinterland and coastal ports, promoting balanced development between the western and eastern regions. The Beibu Gulf port cities (Qinzhou, Fangchenggang, and Beihai) are the final stop of the main land transport of the Western Land-Sea New Channel, and the Beibu Gulf region is an important area for transferring the Western Land-Sea New Channel to the Maritime Silk Road. Strengthening cooperation between the Hainan Free Trade Port, Zhanjiang City, and the Beibu Gulf port cities will effectively enhance the logistics transportation efficiency between the Western Land-Sea New Channel and the Maritime Silk Road, further reinforce the hub function of this channel connecting the inland and overseas markets, promote the western inland region to connect more efficiently with the Regional Comprehensive Economic Partnership (RCEP) market and even the global trade network, expand the level and scope of the opening up of the inland region to the outside world, further release the economic potential of China’s inland region, and promote the healthy development of the domestic and international dual-circulation economic ecology.

4.2 Optimizing the Industrial Configuration of the Qiongzhou Strait and the Beibu Gulf Region to Create a New Growth Pole for the Beibu Gulf Pan-Bay Area Economy

The complementation and integration of industries in the Qiongzhou Strait and the Beibu Gulf region are conducive to making up for the shortcomings of the industrial chains in the three regions across the two shores, leveraging their industrial advantages, building a complete regional industrial chain, triggering an industrial scale agglomeration effect, and driving regional economic development.

According to the analysis of the development status of cities on both shores of the Qiongzhou Strait and the Beibu Gulf region in Chapter 2, it is found that the industrial focuses of the Hainan Free Trade Port, Zhanjiang City, and the Beibu Gulf port cities are different. The Hainan Free Trade Port relies on the development of the tertiary industry—in other words, the tertiary industry economy of the Hainan Free Trade Port is developed; the secondary industry is the main industry in the Beibu Gulf port cities, which have a good industrial foundation; and Zhanjiang’s primary, secondary, and tertiary industries develop in a balanced manner. In 2024, the gross output value of the primary industry in the Hainan Free Trade Port was greater than that of the Beibu Gulf port cities and Zhanjiang City; on the other hand, the gross output value of the secondary industry in the Beibu Gulf port cities was greater than that of the Hainan Free Trade Port and Zhanjiang. Through comparison, such differences can allow the industries of the Qiongzhou Strait and the Beibu Gulf region to complement and integrate with each other. For example, since the Hainan Free Trade Port has a developed tertiary industry and a large gross output value of the primary industry, Zhanjiang City and the Beibu Gulf port cities can coordinate

resources to help the Hainan Free Trade Port leverage its advantages, focusing on developing the tertiary and primary industries, and constructing new growth poles for the primary and tertiary industries within the Beibu Gulf region. The emergence of the scale effect will first lower the CPI of the Hainan Free Trade Port, and concurrently, it will radiate to the entire Beibu Gulf region, driving the development of the primary and tertiary industries across the whole area, and promoting the vigorous development of the financial industry and other modern service industries within the region. The Beibu Gulf port cities have a large gross output value in the secondary industry and have formed industrial scales in the heavy chemical industry, financial smelting, and grain and oil processing, while Zhanjiang also has a deep industrial foundation. Simultaneously, both the Beibu Gulf and both shores of the Qiongzhou Strait are rich in mineral resources. The Hainan Free Trade Port, Zhanjiang City, and the Beibu Gulf port cities can coordinate policy resources and reasonably allocate natural resources to prompt the secondary industry of Zhanjiang City and the Beibu Gulf port cities to improve quality and efficiency, vigorously develop new quality productive forces industries, so that in the short term, the Beibu Gulf region can possess a complete industrial chain and high-tech industrial chain like the Yangtze River Delta region, keeping the internal PPI stable, and elevating the economic development of the Beibu Gulf region to a new stage.

4.3 Optimizing and Integrating the Port Resources and Coastal Industrial Resources of the Qiongzhou Strait and the Beibu Gulf is Conducive to Port Transshipment and Releasing Regional Tourism Consumption Potential Across the Three Regions

The Hainan Free Trade Port, Zhanjiang City, and the Beibu Gulf port cities all possess estuaries and natural deep-water ports. In terms of shipping throughput, because it backs onto ASEAN and serves as the final stop of the Western Land-Sea New Channel, the Beibu Gulf port cities possess a clear advantage. As the shipping transshipment hub for the Greater Bay Area, and with the strengthening of cooperation between the Hainan Free Trade Port and the Greater Bay Area as well as the dividends of the tourism duty-free policy, Zhanjiang's shipping throughput growth rate has been rapid in recent years, showing a clear upward momentum. If the three regions on both shores of the Beibu Gulf operate independently, it will be difficult for shipping logistics and coastal industries to form a larger scale effect. The Qiongzhou Strait-Beibu Gulf port cluster spans across the three provinces (regions) of Guangdong, Guangxi, and Hainan, and has long been constrained by the division of administrative regions, generally suffering from problems such as extensive shoreline development, repetitive construction of functional berths, and homogeneous competition in route networks. Some ports adopt low-price strategies to compete for limited supply sources, resulting in a low overall profit rate for the regional port industry, and critical resources such as shorelines and fairways failing to reach optimal allocation status.

Meanwhile, under the original separate governance model, problems such as cross-regional port scheduling information barriers, inconsistent customs clearance and inspection standards, and unconnectable operating processes exist. This easily leads to congestion during peak periods of

roll-on/roll-off transportation, and cross-port transshipment goods need to undergo multiple declarations and loading and unloading operations, which not only increases time loss but also significantly pushes up logistics costs, being particularly unfavorable for time-sensitive cargo types (such as tropical high-value agricultural products and precision components). If coordinated integration is implemented, the mutual openness and interconnection of port operation information platforms can be achieved, and an integrated customs clearance mode (such as “one declaration, one inspection, one release”) can be promoted, thereby significantly improving vessel berthing efficiency and cargo transshipment speed. According to a report by China Economic Net, the three customs of Zhanjiang, Haikou, and Chongqing worked together to coordinate efforts, so that a batch of export goods arriving at Guangdong’s Zhanjiang Port from Chongqing’s Guoyuan Port via railway, then transshipped to Yangpu Port via sea transport, and finally leaving the country to Yangon, Myanmar, had their customs clearance time compressed by 30% compared with the traditional transshipment mode, and the comprehensive logistics cost was reduced by approximately 15%. It can be seen from this news report that this Hainan “rail-sea intermodal transport + free trade port transshipment” new channel will provide valuable feasible experience for the domestic and international shipping trade and logistics integration of the Hainan Free Trade Port, Zhanjiang, and Beibu Gulf port cities. Integrating the port resources of the Qiongzhou Strait and the Beibu Gulf can both alleviate the logistics bottleneck in the construction of the Hainan Free Trade Port and expand the radiation scope of the economic hinterland of Beibu Gulf Port and Zhanjiang City, achieving quality and efficiency improvements in the bidirectional north-south logistics channel.

The three regions across the two shores are affected by typhoon weather in summer and maritime heavy fog in winter, thereby restricting regional tourism consumption potential, with the tourism of the Hainan Free Trade Port being particularly seriously affected. Every winter during the peak tourism season, the inbound and outbound ports of the Hainan Free Trade Port experience long-term congestion. Although the Hainan Free Trade Port introduced and implemented an online reservation mechanism for entering and leaving ports, where inbound and outbound passengers use mini-programs or software to make advance reservations for inbound and outbound vessels, allowing shipping capacity to be properly arranged and effectively alleviating congestion, the online reservation mechanism filters out tourists who drop by or have weak determination to travel to Hainan, as well as some logistics transportation personnel, making it difficult for the growth rate of Hainan’s free trade port tourism industry to be sustained. If the port resources of the Qiongzhou Strait and the Beibu Gulf can be integrated, the number of feeder routes, low-altitude transport vehicles in the Qiongzhou Strait, and passenger vessels can be increased. By designing tourism product package tickets for the three regions, and cross-district logistics relay and cross-district warehousing relay services to drive the construction of a tourism transportation and logistics transportation linkage system for the three regions, and leveraging port collaboration and efficient transshipment networks to enhance cross-regional tourism experience and logistics warehousing convenience, the impact of the typhoon season and winter

maritime heavy fog on the tourism, transportation, and logistics industries of the three regions, especially Hainan tourism, will be significantly reduced. Simultaneously, it will fully release the tourism consumption potential of the Qiongzhou Strait and the Beibu Gulf region, providing important support for cultivating new economic growth points in the Beibu Gulf Pan-Bay Area.

5. Measures for Constructing the Qiongzhou Strait-Beibu Gulf Bay Area

5.1 Policy Aspect

First, the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities should base themselves on serving the two national strategies of the Western Land-Sea New Channel and the “Belt and Road” to formulate overall coordination policies for the Qiongzhou Strait-Beibu Gulf Pan-Bay Area. When facing cooperation with “Belt and Road” countries and ASEAN countries, shipping logistics and warehousing resources within the region should be coordinated to facilitate accelerating export efficiency and upgrading the scale of entrepôt trade, thereby pulling regional economic growth. When facing western inland land-sea new channel cities, the Hainan Free Trade Port should match it with free trade port duty-free policies, allowing enterprises in inland land-sea new channel cities to enjoy corresponding tax preferences, helping their products sell better overseas, and concurrently helping corresponding enterprises enjoy tariff-free policies for imported raw materials, reducing enterprise costs and improving enterprise gross profit margins. Meanwhile, the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities should reach a consensus on five aspects within the region: talent flow, tax preferences, coordinated optimization of the primary, secondary, and tertiary industries, natural resource integration, and port and shipping logistics networks, to plan regional policies in an overall manner, thereby promoting regional coordinated development, and finally achieving the effect of a regional development community, so as to avoid problems such as industrial homogenization and vicious competition, repetitive and ineffective infrastructure construction, blocked talent flow, and declined regional economic vitality caused by increased tax burdens on enterprises.

5.2 Industrial Aspect

The synergy and integration of the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities in the industrial field can be divided into three stages according to the time dimension: short-term, medium-term, and long-term.

At the short-term initiative level, the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities should collaboratively construct complete primary, secondary, and tertiary industrial chains to strengthen the internal economic cycle of the region and enhance the resilience of overall development. Specifically, the primary industry can rely on the advantages of Hainan’s tropical high-efficiency agriculture to cultivate high-quality crops and characteristic resources; the secondary industry in Zhanjiang and the Beibu Gulf port cities should focus on deep and primary processing of grain and oil as well as high-end manufacturing, transforming crops into high-value-added commodities; the tertiary industry needs to develop logistics, trade, and financial services to promote production-sales docking

through port hubs. Specifically, for example, high-quality crops such as tropical fruits and rubber from Hainan can undergo grading treatment and deep processing in the processing parks of the Beibu Gulf port cities and Zhanjiang, being made into high-end grain and oil products or biomaterials, and relying on the convenience of the regional logistics network to be exported overseas or circulated and sold in the domestic market.

At the medium-term initiative level, the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities should collaboratively advance the complementary development of industries. The cities in the three regions across the two shores need to deepen exchanges and cooperation to make up for the shortcomings of their respective industrial structures; meanwhile, by coordinating human resources and policy support, they can cultivate and develop their advantageous industries, expand industrial scale, form scale effects, and further radiate and drive the Qiongzhou Strait and Beibu Gulf regions, promoting coordinated economic growth in various regions.

The long-term initiative is to rely on the principle of comparative advantage to integrate regional resource factors, build a cross-regional industrial chain for high-precision electronic manufacturing with a clear division of labor, plan characteristic mineral raw materials of the three regions in an overall manner, rely on the international logistics hub function of the Beibu Gulf ports and the mature advanced manufacturing industrial supporting foundation of Zhanjiang City to build the resource and spatial carrier of the industrial chain, and establish the industrial chain operations headquarters through the open policy dividends of the Hainan Free Trade Port to undertake core functions such as product design and R&D, supply chain scheduling, brand operations, and market expansion. This process forms a complete industrial closed loop from front-end R&D and design to mid-end matching and back-end processing, avoiding the problem of fragmented links in cross-regional industrial layout, and improving regional technological competitiveness and manufacturing competitiveness. In addition, it can also develop cross-border logistics, cross-border e-commerce, cross-border tax legal services, and cross-border financial services, forming an integrated circulation system of “production-processing-service” to achieve resource optimization allocation and collaborative win-win outcomes.

In the flow of industrial data factors, the open sharing within the region of the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities should be promoted. Currently, society is in a window period of transformation taking artificial intelligence as a new productive force, and is also in a new era where massive data drives industrial iterative upgrades. Therefore, it is suggested to incorporate Zhanjiang and the Beibu Gulf port cities into the data secure flow policy framework of the Hainan Free Trade Port. The three parties should formulate unified standards for data regarding industry, personnel, shipping, logistics, and taxation, and under the premise of ensuring data security, realize the free flow, traceability, and immutability of data, which will significantly improve the readability and availability of data, thereby accelerating industrial coordination, cooperation, and even integration and optimization within the Beibu Gulf region.

In terms of shipping logistics, through cross-administrative-region coordination and integration among the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities, the ports within the region should be mutually opened and shared, improving the shipping logistics efficiency and warehousing capacity of ports within the region. According to the port natural conditions, locational endowments, and hinterland economic characteristics of the three regions, a systematic functional division of labor and operation should be carried out for external logistics transshipment or trade import and export in the Beibu Gulf region, and internal shipping cargo within the Beibu Gulf region can be allocated through small and medium-sized cargo ships, avoiding repetitive port functions and repetitive port investment and construction within the region.

5.3 Investment and Financing Aspect

The collaborative force of the Hainan Free Trade Port, Zhanjiang, and the Beibu Gulf port cities in investment and financing can also be divided into three stages according to the time dimension: short-term, medium-term, and long-term.

In the short term, in terms of building a regional industrial chain closed loop, the governments of the three regions should establish a special industrial fund. This industrial fund will be managed and operated in a market-oriented manner to cultivate and incubate small and medium-sized innovative enterprises in the primary, secondary, and tertiary industries within the region, making up for the shortcomings of enterprises within the region being numerous but not strong, and having slow technological updates. They should strengthen cooperation among enterprises within the region, and leverage the role of leading enterprises in the primary, secondary, and tertiary industries within the region to drive the industrial chain, making up for the incomplete primary, secondary, and tertiary industrial chains within the region that prevent the formation of an internal regional cycle.

From a medium-term perspective, the governments of the three regions will take the lead in establishing a special investment fund to uniformly coordinate and plan port construction within the region. According to the Western Land-Sea New Channel strategy and the “Belt and Road” strategy, and in accordance with the regional characteristics, hydrological features, and hinterland economic characteristics of each port, construction will be carried out at different levels, avoiding repetitive investment in infrastructure and excessive advance investment in port construction within the region.

From a long-term perspective, the governments of the three regions will jointly establish one or two high-precision electronic manufacturing enterprises and match them with corresponding investment funds. Based on the existing industrial foundation, they will build a regional high-precision electronic manufacturing industrial chain, forming a complete industrial closed loop from upstream mineral mining to front-end R&D and design, then to mid-end matching, and final-end processing, thereby improving regional technological competitiveness, attracting enterprises to settle in, and attracting talents to settle down, promoting the economic development of the three regions.

In addition, given that the foreign trade businesses of the ports in the three regions are intensive and port operations are busy, digital asset tokens similar to Ethereum smart contracts can be issued relying

on port charging rights and warehouse rent charging rights. Such digital assets can be used for settlement and payment of digital RMB and other national currencies, expanding the asset scale of the three regions, broadening financing channels, and improving the efficiency of regional external currency settlement. Concurrently, the immutability and traceability possessed by blockchain technology can effectively guarantee the security of digital assets in the three regions.

6. Conclusion

This paper summarizes previous research on the integration of the Qiongzhou Strait and the development of the Beibu Gulf, and finds that existing studies on the integrated development of Beibu Gulf port cities, the Hainan Free Trade Port, and Zhanjiang are relatively scarce. Subsequently, by exploring the current development status of the Beibu Gulf port cities, the Hainan Free Trade Port, and Zhanjiang from the aspects of development policies, industries, population, natural resources, culture, and shipping, this paper analyzes the respective development bottlenecks of the three entities. Finally, specific measures and implementation pathways for regional coordinated cooperation are proposed.

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References

- Dong, H., & Hao, D. J. (2021). Research on Key Fields and Paths of Industrial Linkage between Hainan Free Trade Port and ASEAN Countries. *Business Economics*, (1), 87-88. <https://doi.org/10.19905/j.cnki.syjj1982.2021.01.028>
- Haikou Municipal People's Government. (2026). *Three Customs of Haikou, Zhanjiang, and Chongqing Cooperate to Deliver Efforts: The First Batch of "Rail-Sea Multimodal Transport" Export Goods of Hainan Free Trade Port Successfully Cleared Customs* (2026-05-12). <https://www.haikou.gov.cn/zfdt/hkyw/202605/t1524806.shtml>
- Haikou Municipal Social Science Federation Project Team. (2019). Research on the Strategy and Countermeasures for Integrated and Win-Win Development of Qiongzhou Strait under the Background of Building a Free Trade Port with Chinese Characteristics. *Continental Bridge Horizon*, (4), 87-91.
- Huang, Y., Zhang, Y. K., & Xie, R. J. (2023). Under the RCEP Framework, Cooperation Research on the High-Quality Development of Cruise Tourism between Hainan Free Trade Port and ASEAN Cruises. *Pearl River Water Transport*, (20), 42-46. <https://doi.org/10.14125/j.cnki.zjsy.2023.20.027>
- Li, X. L. (2026). Research on the Mechanism of eVTOL Flight Promoting the Integration of Regional Cultural Tourism—Taking the Greater Bay Area as an Example. *Southern Forum*, (3), 33-36.

- Liu, J. C., Yang, R. J., & Lin, T. (2018). Research on Countermeasures for the Integrated Development of Qiongzhou Strait under the Background of Building a Free Trade Port with Chinese Characteristics. *Journal of Hainan University (Humanities and Social Sciences Edition)*, 36(5), 36-44. <https://doi.org/10.15886/j.cnki.hnus.2018.05.006>
- Liu, Q. (2023). The Role of Hainan Free Trade Port in Building the China-ASEAN Blue Economy Partnership Cooperation Mechanism. *The South China Sea Academy Journal*, 9(1), 39-43.
- Liu, Y. L. (2022). Development Positioning of Hainan Free Trade Port. *Co-operative Economy & Science*, (23), 70-71. <https://doi.org/10.13665/j.cnki.hzjjykj.2022.23.022>
- Mo, X. X., Lan, Z. B., He, H. B. et al. (2026). Implementation Path of Digital Countryside in Guangxi under the Background of Integrating into the Greater Bay Area. *Hubei Agricultural Sciences*, 65(3), 224-233. <https://doi.org/10.14088/j.cnki.issn0439-8114.2026.03.035>
- Pei, G. Y., & Zhang, D. K. (2026). Research on the Deep Integration of Digital and Real Economies from the Perspective of Linkage Development between Hainan Free Trade Port and Greater Bay Area. *The South China Sea Academy Journal*, 2026(2), 9-19.
- Peng, X. Z., & Huang, L. Q. (2023). Research on Regional Economic Cooperation between China's Characteristic Free Trade Port and ASEAN under the Background of Opening up. *Journal of Hainan University (Humanities and Social Sciences Edition)*, 41(6), 50-58. <https://doi.org/10.15886/j.cnki.hnus.202212.0005>
- Wen, W. H. (2016). *Research on the Mechanism of Coordinated Development between Ports and Cities*. Dalian Maritime University.
- Xu, W. H., Zhai, Y., Liu, W. G. et al. (2026). Research on the Regional Cooperation Mechanism and Path of Beibu Gulf under the Background of Free Trade Port. *Farm Economic Management*, (1), 54-59.
- Zhang, C. (2022). Linked Development of Digital Economy between Hainan Free Trade Port and ASEAN Countries: Opportunities, Effects, and Strategies. *Business Economics*, (11), 87-89. <https://doi.org/10.19905/j.cnki.syjj1982.2022.11.015>