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Government policy, industrial clusters, and the blue economy in the People's Republic of China: A case study on the Shandong Peninsula blue economic zone

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**GOVERNMENT POLICY, INDUSTRIAL  
CLUSTERS, AND THE BLUE ECONOMY  
IN THE PEOPLE'S REPUBLIC OF CHINA:  
A CASE STUDY ON THE SHANDONG  
PENINSULA BLUE ECONOMIC ZONE**

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**Abstract**

The blue economy or marine economy has become increasingly important for countries not only to generate a new source of growth but also to construct the coexistence between humans and the environment. The People's Republic of China (PRC) has attached great importance to the blue economy since the beginning of the 21st century. During the past two decades, the PRC's blue economy has undergone considerable development. Its share in the GDP has increased substantially and remains large. The blue economy has become a national strategy, though traditionally the PRC has not relied heavily on marine resources. The PRC's approach to the blue economy has also experienced transformative change during the last decade. In the policy directive and at the practice level, ecological sustainability and marine environmental protection have already become an important part of the blue economy in the PRC.

The paper argues that government policy and industrial clusters are the two most important factors that contribute to the development of the PRC's blue economy, as the case study of the Shandong Peninsula Blue Economic Zone (SP-BEZ) demonstrates. First, government policy is the basis for the establishment and development of the SP-BEZ. The PRC's government has provided policy guidance and assistance for the development of the blue economy. Both central and municipal governments have sponsored the SP-BEZ project, providing considerable financial and technological support. With the government's encouragement, blue finance has developed due to the public-private partnerships in the blue economy. Second, industrial clusters are both the means and the ends for the SP-BEZ. To promote the development of the blue economy in the SP-BEZ, the government has made full use of Shandong Peninsula's industrial advantages to redistribute and restructure the industries in the region. The SP-BEZ has formed industrial clusters with the support of its advantageous scientific and technological research and development in the blue economy. These industrial clusters have not only integrated a wide range of different industries but also helped to promote the domestic regional economic integration in the Shandong Peninsula.

**Keywords:** blue economy, marine economy, blue economic zone, government policy, industrial cluster, People's Republic of China

**JEL Classification:** G38, O11, O13, O47, Q28, Q57

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## 1. INTRODUCTION

The People's Republic of China (PRC) has attached substantial importance to the blue economy in recent years. In the *12th Five-Year Plan for National Economic and Social Development (2011–2015)*, the PRC set the goal to expand the blue economy's share of the gross national product (GDP) to 10% by 2015 (State Council 2011a). According to the *China Blue Economy Development Report 2019*, a joint release from the PRC's National Development and Reform Committee and the Ministry of Natural Resources, the volume of the blue economy, or the gross ocean product (GOP), reached 8,341 billion RMB in 2018, accounting for 9.3% of the country's GDP. In the past decade, the PRC's blue economy has continued to grow at a high rate of more than 6.5%. In the *13th Five-Year Plan (2016–2020)*, the PRC promoted the blue economy, or the marine economy, as a national strategy (State Council 2016). In delivering the State Council's *Government Work Report* in 2019, Premier Li Keqiang confirmed the PRC's commitment to "develop the blue economy, protect the marine environment and build a maritime power." The country has also updated its ambitious goal to expand the blue economy's share of the GDP to 15% by 2035.

Under such circumstances, in 2011, the PRC's State Council approved the plan to develop a blue economic zone (BEZ) on the Shandong Peninsula. The Shandong Peninsula BEZ (SP-BEZ) is the PRC's first and only regional strategy centered on the blue economy. The SP-BEZ covers eight cities, specifically Jinan, Qingdao, Yantai, Zibo, Weifang, Weihai, Dongying, and Rizhao, with a sea area of 159,500 square kilometers and a land area of 64,000 square kilometers. Among the eight cities, Qingdao is not only the engine for the SP-BEZ's development but also a pioneer of the entire country's blue economy. It has 30% of the country's marine education and research institutions, 50% of its marine research personnel, and 70% of its marine experts. According to the city's Bureau of Statistics, Qingdao's GOP reached 250 billion RMB in 2016, accounting for more than one-fourth of its GDP.

The goal of the SP-BEZ is to develop a modern marine industrial cluster with relatively strong international competitiveness, a world-leading education center of marine science, a pilot zone for national marine economic reform and opening up, and a national key demonstration zone of marine ecological civilization (State Council 2011b). The strategy of the SP-BEZ is to redistribute the regional industries in the Shandong Peninsula and make full use of its advantages to focus on the blue economy. Under such policy guidance, the GDP of Shandong Province and Qingdao City has increased greatly. The contribution of the blue economy to the GDP growth is also significant. For example, according to the Ministry of Natural Resources (2018)' *Statistics Bulletin of the PRC's Blue Economy*, the blue economy alone helped the city's GDP to grow by 3.9% in 2017.

What are the reasons for the rapid development of the PRC's blue economy in the past decade? To what extent has the SP-BEZ contributed to the development of the blue economy in the PRC? What implications can the SP-BEZ provide for other countries if they are to promote their blue economy? To answer such questions, the paper examines the role of both government policy and industrial clusters in the development of the blue economy through an empirical case study on the SP-BEZ in the PRC.

The research will combine both quantitative and qualitative studies. The study will collect and make use of the official data that the PRC's State Council, National Development and Reform Committee, and China Ocean Development Foundation as well as municipal governments, such as those of Shandong Province and Qingdao City, have released.

## **2. LITERATURE REVIEW**

### **2.1 The Blue Economy**

“Blue economy” has become a buzzword in recent years. According to the World Bank (2017), the blue economy involves the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health. Since its activities are centered on the ocean, some literature has used the terms “ocean economy” or “marine economy,” which are basically synonyms for “blue economy.” Particularly in the context of the PRC, for example, government documents and media reports have used “marine economy” more frequently. This article will use these terms interchangeably as it aims to include diverse perspectives and cite different sources of material.

There are already some quite comprehensive study reports on the blue economy. Some have tried to clarify the definition of the blue economy as “the set of environmentally and socially sustainable commercial activities, products, services and investments dependent on and impacting coastal and marine sources” (Whisnant and Reyes 2015). The OECD’s (2019) study report focused on assessing the crucial role of innovative approaches in a sustainable ocean economy and argued that it is science and technology that enable economic growth and ecosystem preservation in the blue economy. The study report released by the Economist (2015) emphasized the “industrialization” effect in the blue economy and argued that, “alongside established ocean industries, emerging and new activities—offshore renewable energy, aquaculture, deep seabed mining and marine biotechnology are often cited—will bring new opportunities, growth and greater diversity to the ocean economy.” In addition, recent academic research articles have stressed the important role of the government or policy in developing the blue economy. Some have argued that the blue economy is necessarily a complex governmental project that opens up new governable spaces and rationalizes particular ways of governing (Choi 2017). Others have analyzed the role of national macro-economic strategies in the blue economy through empirical and comparative case studies of the EU, Indonesia, and the PRC (Lu et al. 2019).

### **2.2 The Blue Economy in the PRC**

The rapid development of the blue economy in the PRC has also attracted academic research attention. The study report that the Center for American Progress released argued that the PRC model stresses an integrated, cross-sectoral approach to the development of coastal areas, offering lessons for other countries, such as the United States (US), after comparing the blue economy of the PRC with that of the US (Conathan and Moore 2015). The report also called for international cooperation in the blue economy between the PRC and the US. The study report that the David Lucile and Packard Foundation (2015) produced stressed the importance of four factors, specifically the government, academia, civil society, and philanthropy, in the PRC’s blue economy development strategy. Both studies recognized that the PRC’s approach to the blue economy has transformed from being development oriented to also being committed to marine ecological sustainability and marine resource preservation. Some academic research has contributed to studies on the PRC’s blue economy from the perspective of methodology by establishing the industrial classification framework and sorting out the available statistical system in the ocean economy (Wang 2016a). Some studies have tried to define and quantify the value of major ocean industries in the PRC and examined the growth in the PRC’s major ocean industries during a given time period (Zhao, Hynes, and He 2014). Others have examined the contribution of marine

capital and marine labor to the PRC's regional marine economic development (Jiang, Liu, and Su 2014).

### **3. THE DEVELOPMENT OF THE BLUE ECONOMY IN THE PRC**

#### **3.1 The Government Policy on the Blue Economy's Development in the PRC**

The PRC has attached importance to the marine economy since the 1990s. In the first decade of the 21st century, the average growth rate of the PRC's marine economy, or the GOP, was 16.35%, much higher than the overall GDP growth rate during the same time period. From 2000 to 2011, the contribution of the PRC's marine economy to the national economy rose from 6.46% to 13.83% (Jiang, Liu, and Su 2014). Particularly in coastal areas, marine industries have become the most important new source of economic growth. The PRC has not typically been at the top of the list of the countries that rely most heavily on their ocean resources (Conathan and Moore 2015). Since the land resources in the PRC, as well as in other countries around the world, are increasingly on the verge of economic and ecological exhaustion, the value of the oceans as a resource for economic development has become increasingly prominent (Zhao, Hynes, and He 2014).

In 2003, the State Council issued the first *National Marine Economy Developing Plan Guideline*. It raised the development goals to increase the marine economy's share of the GDP to 4% by 2005 and over 5% by 2010 and gradually make the marine economy an important backbone for national development. Since this was the initial development stage of the PRC's marine economy, the goals seemed to be rather conservative. As a matter of fact, the marine economy's share of the GDP exceeded 9% in 2010. The document pointed out that there are 11 marine economic zones in the PRC. In general, there are three large marine economy areas, the Circum-Bo Sea area, the Yangtze River Delta, and the Pearl River Delta. These three areas include all 11 marine economic zones and account for more than 80% of the PRC's marine economy GDP.

In 2008, the State Council issued the *National Guideline for Marine Development Planning*. This was the first overall plan for marine areas since the establishment of the PRC. It proclaimed that the marine industry must occupy a very important strategic position in the PRC's socialist modernization (State Council 2008). In 2011, marine economic development first appeared in the PRC's *12th Five-Year Plan (2011–2015)* as a top-level strategy. Since then, the PRC's government has released plans and documents to stress the sustainability of the marine economy (Zhang and Ravesteijn 2019). In addition, the *12th Five-Year Plan* officially approved the establishment of the SP-BEZ.

At the 18th National Congress of the Chinese Communist Party in November 2012, then President Hu Jintao proclaimed that the country would develop itself into a maritime power, a statement that had both political and economic meaning. Politically, the PRC wanted to enhance its influence and protect its national interest in the sea. Economically, it identified the marine economy as an important sector of the PRC's economy. In 2013, the state council approved the *Marine Career Development Plan for the 13th Five-Year Plan (2016–2020)*, which is a comprehensive plan to promote the sustainable and efficient development of the marine economy (Jiang, Liu, and Su 2014).



In July 2013, President Xi Jinping stressed that building a maritime power is one of the PRC's most important development goals. After President Xi took office, the Maritime Silk Road, one of the two branches of the Belt and Road Initiative (BRI), was put forward in 2013. By starting the Maritime Silk Road, the PRC aimed not only to increase its geopolitical maritime influence but also to open up to the ocean and promote marine economic development through cooperation with other countries. In May 2017, the National Development and Reform Committee issued the *13th Five-Year Plan on National Marine Economy Development*. Marine economic development continues to appear on the list of national strategies in the central government policy documents. At the 19th National Congress of the CCP in October 2017, President Xi reiterated the strategic goal to build a strong maritime country.

All these aforementioned government policy documents and statements that the government has issued since 2003 have shown the PRC's strong determination to develop an advanced marine economy. However, the PRC's approach to the marine economy proved to focus too much on the development strategy in the first decade of the 21st century. The government mostly regarded the marine economy as a new growth engine for the PRC's overall economic development. From the second decade of the 21st century, particularly with the manifestation of the *12th Five-Year Plan*, the PRC adjusted its approach to blue economic development and started to pay more attention to sustainability and environmental protection.

### 3.2 The Evolution of the Blue Economy's Development in the PRC

As mentioned above, the PRC has made great achievements in the development of the blue economy during the last two decades. Table 1 shows the PRC's marine economy GDP and its share in the country's overall GDP in the past decade. It is clear that the scale of the marine economy has increased significantly. For example, the volume almost doubled from 4,557 billion RMB in 2011 to 8,942 billion RMB in 2019. Meanwhile, the marine economy's share of the GDP has been constantly over 9% in the past decade, although there has been no significant increase in the share.

**Table 1: The GDP and Share of the PRC's Marine Economy**  
(GDP in Billion RMB; Share in %)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Marine GDP	4,557	5,009	5,431	5,994	6,467	7,051	7,761	8,342	8,942
GDP Share	9.7	9.6	9.5	9.4	9.6	9.5	9.4	9.3	9.0

Data Source: State Oceanic Administration, Ministry of Natural Resources, the PRC.

Table 2 shows the growth rate of the marine economy in the past decade, which peaked at 10.4% in 2011. It has decreased since then as the PRC's overall GDP growth rate also dropped from nearly 10% to only slightly over 6% in 2019. The marine economy has contributed to the PRC's economic growth. At the same time, it has benefited from the overall economic policy and the economic growth of other industries. This has inevitably affected the marine economy. Determining how to maintain a relatively high growth rate for the marine economy against the background of the PRC's so-called new normal economy is a major challenge.

**Table 2: The Growth Rate of the PRC's Marine Economy**  
(in %)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Marine Growth Rate	10.4%	7.9%	7.6%	7.7%	7.0	6.8	6.9	6.7	6.2
Overall Growth Rate	9.55	7.86	7.77	7.42	7.04	6.85	6.95	6.75	6.11

Data Source: State Oceanic Administration, Ministry of Natural Resources, the PRC; National Bureau of Statistics, the PRC.

As for the specific industries of the PRC's marine economy, Table 3 shows the GDP and growth rates of the major marine industries in 2019. It is apparent that marine science accounts for a large portion as the PRC has been active in investing in scientific and technological research and development in marine industries. The growth rates of different marine industries vary significantly. This means that, even though the marine economy itself is a newly emerging industrial area, traditional and new industries still exist in this area. The data show that marine shipbuilding, marine tourism, and marine biomedicine are the three marine industries that grew the fastest in 2019. On the contrary, traditional marine industries, such as marine mining and marine salt, had relatively low growth rates.

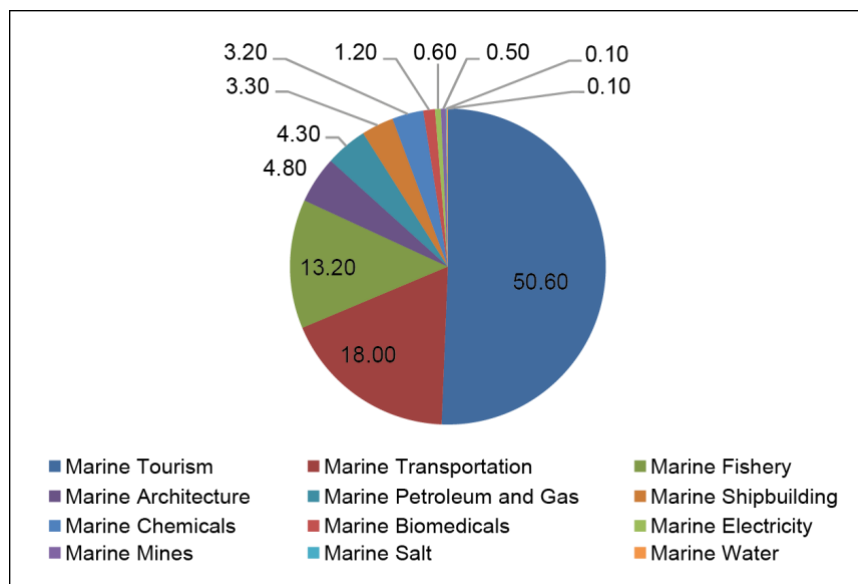
**Table 3: GDP and Growth Rate of Major Marine Industries in the PRC in 2019**

Marine Industries	GDP (in Billion RMB)	Growth Rate
Marine Science	2,159	8.3%
Marine Tourism	1,809	9.3%
Marine Transportation	643	
Marine Fishery	472	4.4%
Marine Architecture	173	4.5%
Marine Petroleum and Gas	154	4.7%
Marine Shipbuilding	118	11.3%
Marine Chemicals	116	7.3%
Marine Biomedicals	44	8.0%
Marine Electricity	20	7.2%
Marine Mines	19	3.1%
Marine Salt	3	0.2%
Marine Water	2	7.2%

Data Source: State Oceanic Administration, Ministry of Natural Resources, the PRC.

Figure 1 shows the make-up of different marine industries and their share in the PRC in 2019. It indicates that the largest three marine industries in the PRC are marine tourism, marine transportation, and marine fishery. Interestingly, marine tourism accounts for about half of the total marine GDP, meaning that the PRC's marine economy already constitutes a significant share of the service industry. For example, the marine economy's first industry, second industry, and third industry accounted for 4.2%, 35.8%, and 60.0%, respectively, in 2019. On the one hand, this shows the third industry's high degree of participation in the PRC's marine economy. On the other hand, it proves that the balance among the different marine industries needs improvement.

**Figure 1: Make-Up of Major Marine Industries in the PRC in 2019**  
(%)



Data Source: State Oceanic Administration, Ministry of Natural Resources, the PRC.

In addition to embarking on blue economic development domestically, the PRC has made efforts to increase its influence in the global discourse on the blue economy. For example, it has successfully organized and held the Asia-Pacific Economic Cooperation (APEC) Blue Economy Forum. The APEC Blue Economy Forum has taken place five times so far, respectively in 2011, 2012, 2014, 2016, and 2018, all in the PRC. The theme of the fifth forum in Ningbo City of Zhejiang Province was “Local Blue Economy Practice: Policy and Approach.” The PRC aimed to promote blue economic cooperation and local best practice sharing in the Asia and the Pacific region. Another example is the China Marine Economy Expo (CMEE). The CMEE, sponsored by the PRC’s Ministry of Natural Resources and Guangdong Provincial Government, has happened annually since 2014. The latest CMEE, with the theme “Open Cooperation, Win-Win and Sharing,” occurred in Shenzhen City of Guangdong Province in October 2020. The expo involved exhibitions in a wide range of areas, such as ships and port shipping, ocean resource development, high-end marine equipment, ocean electronic information, marine biomedicine, and marine ecology environment protection and safety. The CMEE is not only a window through which foreign countries can learn more about the PRC’s current situation and the developing trends of the blue economy but also an opportunity for foreign businesses to start cooperation with the PRC in the blue economy.

Meanwhile, there has been gradual bridging of the gap between the PRC’s concept of the “blue economy” and that of Western countries. In general, there are at least two points of difference when comparing the PRC’s blue economy with that of Western countries. First, the PRC’s blue economy tends to be more development oriented as the initial motive was to make use of ocean resources to provide new sources of economic growth. Second, the PRC started to recognize the issue of environmental protection for the ocean relatively later than Western countries. However, the situation has improved significantly in the past two decades. For example, the concept of the blue economy in the PRC’s *2008 National Marine Industrial Development Plan* signified the integrated development of coastal and marine resources as part of a strategic national economic development plan instead of referring to a new model of marine

resource use that emphasizes environmental sustainability (Conathan and Moore 2015). However, the PRC's latest concept of the blue economy is the sum of all kinds of activities associated with the development, utilization, and protection of the marine environment. For example, Wang Hong, the vice chair of the PRC's delegation to the Rio+ 20 Summit in 2012, said, "The blue economy is a new thinking on development. It entails promoting marine economic development while protecting the environment and achieving sustainable resource use." Currently, the PRC's idea of the blue economy, though evolving late to include a new focus on "sustainable development and conservation," prioritizes integrating coastal and ocean resources into a broader plan for national economic development and encouraging the marine industry to play a greater role in the economy (The Economist 2015).

Why did the shift from a focus on development to an emphasis on sustainability and environmental protection take place in the PRC's blue economy policy? There are three main reasons. First, the PRC's economic development model has gradually changed since entering the 21st century. Second, the awareness of environmental protection has improved considerably on both the governmental and the civil level during the same time period. Third, the PRC has recognized the great value of ocean resources for long-term economic development. To ensure the sustainability of its blue economy, the PRC has enacted and enforced a range of laws and regulations to protect the marine environment. To provide some examples, on 1 August 2015, the State Council issued a notice on national marine functional area planning that called for shoreline protection of not less than 35% and an increase in marine protected areas' coverage to 5% of the EEZ. Furthermore, in March 2016, the proposed outlines of the *13th Five-Year Plan* that the National People's Congress issued called for greater control of fishing efforts, the protection of coastal ecosystems, enhanced wetland restoration, and the implementation of marine ecosystem-based management (David Lucile and Packard Foundation 2019).

The PRC's important approach to blue economic development is to designate marine economic zones in areas that are rich in ocean resources and nature. In these marine economic zones, the government aims not only to make use of ocean resources for industrial development but also to put the ocean under governmental governance and avoid environmental destruction. Since 2019, the PRC has been pushing forward scientific innovations in the marine industry and has established six national marine economic innovation and development demonstration areas and seven national industrial demonstration bases for rejuvenating the marine industry with science and technology (Lu et al. 2019). Among these are three strategic marine economic zones, specifically the SP-BEZ, the Guangdong Provincial Blue Economy Experimental Zone, which the government approved in July 2011, and the Zhejiang Provincial Blue Economy Experimental Zone, which it approved in 2012. As the names suggest, the SP-BEZ has gained complete approval as a national strategic marine economic zone, while the other two are still experimental. The government has applied the experiences of the SP-BEZ to the other marine economy areas to broaden and deepen the development of the blue economy nationwide. The next section will focus on studying the case of the SP-BEZ and examine the reasons for the PRC's rapid development of the blue economy. Accordingly, the section will focus on analyzing the role of government policy and industrial clusters in the development process of the SP-BEZ.

## 4. CASE STUDY: THE SHANDONG PENINSULA BLUE ECONOMIC ZONE

### 4.1 Government Policy

#### 4.1.1 Central Government Policy

As Choi (2017) argued, the blue economy is necessarily a complex governmental project that opens up new governable spaces and rationalizes particular ways of governing. This is particularly the case for the PRC. Government policy has played the most important role in initiating and promoting the development of the blue economy in the PRC. The previous section has exemplified the PRC's government policy documents and statements on blue economic development. There is no doubt that government policy is the most important driving force behind the development of the PRC's blue economy.

First, the establishment of the blue economic zone is also the result of the interaction between the central and the municipal governments. In April and October 2009, respectively, then President Hu Jintao visited Shandong Province and pointed out that the province should speed up its development of the marine economy, make use of marine resources, nurture advantageous marine industries, and establish the SP-BEZ. It is clear that the establishment of the SP-BEZ took place under the guidance of the central government.

In 2011, the PRC's State Council issued the *Shandong Peninsula Blue Economy Zone Development Plan*, which symbolized the establishment of the SP-BEZ. The plan is part of the national economic development plan, the *12th Five-Year Plan*, which determined the medium-range national economic development goals from 2011 to 2015. This means that the establishment of the SP-BEZ took place within the framework of the PRC's national development strategy. This plan also demonstrated the central government's determination to promote the development of the blue economy. It set the goals of building a modern marine industrial system in the SP-BEZ, greatly enhancing the marine technological innovation ability, and improving the marine biodiversity and environmental condition by 2015 (State Council 2011b). The plan pointed out that, by 2020, the SP-BEZ should be a zone with an advanced marine economy, an optimized industrial structure, and harmony between humans and nature (State Council 2011b). The goals show that the central government's policy focuses not only on economic growth but also on the sustainability of development and, most importantly, the protection and conservation of the marine environment.

Second, the government provided full financial support for the establishment of the SP-BEZ and its industrial development. In June 2012, the PRC's Ministry of Finance and State Oceanic Administration jointly issued the *Notification on Promoting the Marine Economy of the Innovative Development Area*. In this document, the Ministry of Finance clearly expressed its special financial support for the development of marine industries, particularly in areas such as marine biological pharmacy and seafood aquaculture. The purpose is to nurture a number of new companies and develop the fundamental technologies in the core marine industries. Under such circumstances, the SP-BEZ has gradually established a multi-faceted investment mechanism in which the government encourages companies and other economic entities to join the investment with good examples of public-private partnerships (PPPs) (Zhang, Shi, and Han 2018). There is a global trend whereby new market-oriented programs and projects increasingly aim to tap the financial value of the ocean's blue capital, ostensibly fostering income generation and sustainable solutions for conservation finance

(Satizabal et al. 2020). In the PRC, blue finance, the finance invested in blue economy industries, is also gaining more and more attention. Globally, the success rate for PPPs in the blue economy is mixed due to the lack of a coordinated understanding between the investment needs of local governments and communities and the aspirations of companies (Whisnant and Reyes 2015). Therefore, it is important for the PRC's government to rely more on the market to encourage blue finance investment.

The PRC has already established a Green Finance Professional Committee under the Chinese Finance Association and the People's Bank of China. In November 2015, the State Council approved the establishment of the China Oceanic Development Foundation (CODF). The CODF is under the management and organization of the State Oceanic Administration. Its function is to collect public and private funding for the PRC's marine development. The CODF has carried out its activities in areas such as marine spatial planning, blue economic development, marine publicity and education, marine conservation and restoration, and marine science and technology innovation. In May 2020, the China Banking and Insurance Regulatory Commission instructed financial institutions to develop a "blue bond" for the purpose of marine economic development (Gill and Pollard 2020). The Bank of Qingdao, located in the SP-BEZ, is reportedly the pioneering bank to engage in "blue bond" business.

Third, government policies have directed the PRC's changed approach to blue economic development and thus helped to update the PRC's concept of the blue economy. Awareness and more diligent incorporation of environmental, social, and governance considerations into investments in the ocean economy are evolving (The Economist 2015). As mentioned earlier, the PRC's government has realized that it should not apply the development model for its land economy to the blue economy. The blue economy is not only part of the national development strategy but also a way of developing. Therefore, it should give priority to the consideration of the marine ecology. The government's policies pay attention to coordination between the protection of the ocean's ecological resources and the development of the marine economy (Jiang, Liu, and Su 2014). Almost all the government documents have stressed sustainability. There is no doubt that, in reality, the PRC's rapid marine development has also caused some environmental problems. According to the State Oceanic Administration's *Marine Environment Bulletin*, large parts of the PRC's coastal areas and territorial seas are heavily polluted (Conathan and Moore 2015). As the marine economy is a relatively newly emerging economic domain, the PRC's government has been able to make use of the lessons that other industries have learned in the past as well as lessons from advanced countries with regard to environmental protection. Thanks to the changes in policy guidance, the new model of marine development in the PRC places a higher value on the management and conservation of marine resources and ecosystem functions and recognizes the importance of these resources to the newly emerging marine industries and to coastal tourism in particular (Zhao, Hynes, and He 2014).

Fourth, government policy has also tried to enhance international cooperation and bring in foreign investment for the development of blue economy. Thanks to the PRC's government policy, the SP-BEZ has become not only a domestic strategic project for the blue economy but also an international engine and hub for global cooperation on the blue economy. One direct example is the East Asia Marine Cooperation Platform (EAMCP), the headquarters of which is in Qingdao City. During the ASEAN+3 summit in 2013 to 2015, the PRC's Premier Li Keqiang called for the establishment of the EAMCP and pledged that the PRC would invest 30 million RMB in helping to build the platform. After negotiation with the other ASEAN+3 members, the PRC's State Council and State Oceanic Administration finally decided to build the headquarters of the

EAMCP in Qingdao, Shandong. The EAMCP started the Qingdao Forum, which it has held annually since 2018. The theme of the Qingdao Forum 2018 was “manage the ocean and reach out to the deep blue.” The Qingdao Forum has invited experts and professionals from other Asian countries to participate and become a global platform for sharing knowledge and technologies on marine economy. This has helped to improve the brand awareness of the SP-BEZ internationally.

The EAMCP has undoubtedly provided great opportunities for the development of the blue economy in the SP-BEZ. It not only exposes the region to the advanced industries and global market of the blue economy but also brings overseas investment into the region. The PRC’s central government sponsored the establishment of the EAMCP and chose Qingdao as the platform’s headquarters.

#### **4.1.2 Municipal Government Policy**

The previous section addressed the blue economy policy of the PRC’s central government. There is no doubt that, without the central government’s strong policy support, the SP-BEZ could not have achieved its aims. However, the policy of the municipal government is equally important. This section will focus on analyzing the government policy of Shandong Province regarding the development of the blue economy.

As early as 1991, Shandong Province raised and started the so-called “Shandong on the Sea” (*Haishang Shandong*) project. The concept of “Shandong on the Sea” originated from the first national convention on marine affairs, which took place in Beijing in late 1990. The representatives from Shandong expressed their ideas on how to “develop and protect the sea, build the Shandong on the sea.” This laid the foundation for the “Shandong on the Sea” project. Simply put, it is a development strategy to make full use of Shandong Province’s advantages in marine resources and focus on developing the marine economy.

In June 2006, Shandong Province issued the *Shandong Provincial Marine Economy Development Plan* under the *11th Five-Year Plan (2005–2010)*. In response to the *National Marine Economy Developing Plan Guideline* that the State Council issued in 2003, as well as the national *11th Five-Year Plan* for economic development, Shandong Province made its own medium-range development plan exclusively for the marine economy. The plan highlighted the province’s strength in marine resources and called for the building of a marine economic zone, cultivating competitive marine industries and giving the province a strong marine economy. In June 2009, Shandong Province issued *Suggestions on Building the SP-BEZ*. At the same time, it published *Suggestions on Enhancing the Building of the Shandong Peninsula High-Tech Industrial Cluster*. These two documents formed the important bottom-up driving force for the establishment of the SP-BEZ. The frequent interaction of policy momentum between the central government and the Shandong provincial government made clear the necessity of building the SP-BEZ. As a result, the State Council eventually gave its approval.

It is worth noting that not only Shandong Province but also the governments of municipal cities, such as Qingdao, actively updated their policy to enhance the development of the marine economy. In 2016, the central government chose Qingdao City, the central city of the SP-BEZ, as one of the pilot cities for the innovative development of the marine economy in the 13th development plan. In response to this, Qingdao City issued a series of policy directives to promote marine economic development. These included the *Marine Plus Development Plan*, the *Action Plan for Building a Globally Advanced Marine Development Center*, and the *Action Plan for*

*Developing the Marine Economy and Building a Globally Well-Known Marine City*. In June 2019, Qingdao City released the so-called “Ocean Offensive” Development Plan, which aimed to invest 500 billion RMB in 200 core marine projects during the period 2019–2022.

The government policy has brought considerable benefits to the marine economy in Shandong Province. In 2009, the GDP of Shandong Province’s marine economy was 300 billion RMB, accounting for 10% of the province’s total GDP (Xu and Meng 2012). In 2019, the GDP of Shandong Province’s marine economy increased to 1460 billion and accounted for 20.5% of the province’s total GDP. In just one decade, the marine GDP increased by almost five times and its share of the GDP doubled.

## 4.2 Industrial Clusters

### 4.2.1 Industrial Clusters in the SP-BEZ

The blue economy involves a wide range of industries. Depending on the method of categorization, the blue economy consists of nine key industries: fishery and aquaculture; ports, shipping, and marine transport; tourism, resort, and coastal development; oil and gas; coastal manufacturing; seabed mining; renewable energy; marine biotechnology; and marine technology and environmental services. Their dependence and impact on coastal and marine areas make these nine primary industries the key to growing a blue economy (Whisnant and Reyes 2015). With such a diversity of industries, it is necessary to take advantage of industrial clusters to exert an agglomerative effect on the blue economy. In the PRC, it is possible to divide the ocean economy into ocean industries and ocean-related industries. Ocean industries are those that represent the core of the ocean economy and include industries involved in the production or supply of services for developing, utilizing, and/or protecting the ocean, while ocean-related industries refer to the enterprises that form a technical and economic link with major marine industries (Wang 2016b).

According to the *SP-BEZ Development Plan* that the State Council issued in 2011, four aspects reflect the position of the SP-BEZ in the national strategy: advanced marine industrial clusters with international competitiveness; a core area for marine science, technology, and education; a pioneer zone for the reform and opening up of the national marine economy; and a model region of marine biodiversity civilization (State Council 2011b). Among these four aspects, the marine industrial cluster has both the functional means and the goal to develop the marine economy in the SP-BEZ. Again, the plan stressed the importance of sustainability and the environment as it also included the ambitious goal of building the marine biodiversity civilization. Since 2015, the SP-BEZ has issued documents such as the *Guideline on Enhancing Innovative Industrial Clusters* and the *Guideline on Enhancing People’s Innovation and Entrepreneurship*. Under the guidance of these documents, a number of coastal cities have built an innovation and entrepreneurial service center to encourage entrepreneurs in marine industries (Zhang, Shi, and Han 2018). People sometimes refer to these sectors collectively as the “new blue economy” or “blue tech,” and they are fundamental to a strategy of developing “blue clusters” (Conathan and Moore 2015). Shandong Province is promoting the development of emerging marine industries in the fields of biology, new energy, and new materials, and marine-related companies in coastal cities like Qingdao, Yantai, and Weihai are taking advantage of the plan to expand their business or upgrade their services (People’s Daily 2012).



Due to the rapid development of marine science and technology in recent years, all kinds of new marine industries are emerging and thereby expanding the scope of the marine economy (Zhao, Hynes, and He 2014). The SP-BEZ Development Plan involves the construction of “four industrial areas and three industrial parks.” The four industrial areas are Qingdao Western Coastal New Area, Weifang Coastal New Area, Weihai South Sea New Area, and Yantai Eastern New Area. The three industrial parks are the Qingdao PRC–Germany Industrial Park, Rizhao International Seashore City, and Weifang Coastal Industrial Park. To build the SP-BEZ, the region has started to forge six industrial bases, specifically a marine manufacturing industrial base, a shipbuilding and repairing industrial base, a port logistics industrial base, a seashore entertainment industrial base, a new energy industrial base, and a petroleum chemicals industrial base.

Instead of developing all the marine industries evenly at the same time, the government prefers to focus more on the advantageous industries and try to achieve targets as soon as possible. For example, the SP-BEZ is traditionally strong in the biomedical industry. Therefore, it has concentrated more on the biomedical industry and thus made great achievements in this area. To accelerate the development of the bio-industry, at the very beginning of 2013, the State Council issued the *12th Five-Year Plan for Bio-industrial Development*, which identified the marine biomedical industry as one of the key development areas (Zhao, Hynes, and He 2014). Under such policy guidance, new biomedical projects have commenced in the SP-BEZ. One example is *the Blue Medical Tank Plan* of the Marine Biomedical Research Institute of Qingdao. It is worth noting that Qingdao City’s marine biomedical GDP accounts for over 13% of the total industry in the country (Piao 2019).

#### 4.2.2 Industrial Clusters in Qingdao City

As the central city of the SP-BEZ, Qingdao’s development model focuses on the blue economy. In 2013, Qun Li, Party Chief of Qingdao City, said, “Blue economy will lead the city to adjust its development mode and upgrade its industrial structure” (Xie 2013). He also argued that the blue economy would lead the city to adjust its development mode and upgrade its industrial structure (Xie 2013). Qingdao City’s marine economy GDP was 332.7 billion RMB in 2018, which is 21% of Shandong Province’s marine economy GDP, 4% of the PRC’s marine economy GDP, and 27.7% of Qingdao City’s GDP in the same year (Piao 2019).

Compared with the land economy, the marine economic system itself has the characteristics of capital-heavy and technology-intensive production, and marine economic production activities require more technological development (Jiang, Liu, and Su 2014). Qingdao City’s strength lies in marine science and technology. Qingdao has marine scientific research institutions, such as the Ocean University of China, the Chinese Institute of Oceanography, and the Yellow Sea Fisheries Research Institute, as well as new marine research facilities, for instance the Pilot National Laboratory for Marine Science and Technology and the National Marine Equipment Quality Inspection Centre (Gill and Pollard 2020). It is worth noting that science is crucial to achieving global sustainability and adequate stewardship of the ocean since it provides the wherewithal to deepen our understanding of and monitor the ocean’s resources and health as well as predicting changes in its status (OECD 2019).

Taking Qingdao as an example, there are at least seven industrial clusters: the port, petroleum chemicals, shipbuilding, electrical products, biomedical, tourism, and automobile industrial clusters (Cheng, Zhang, and Yin 2015). In 2012, Qingdao City decided to build and integrate the blue industrial base called “One Valley and Two Areas,” which refers to the Blue Silicon Valley that it established in 2012, the West

Coastal New Area that it started in 2014, and the Red Island High-Tech Area that it developed in 2002. It integrated the three into one blue industrial cluster concentrating on technological innovation and international cooperation in the marine industry. As a world-class research and development center for marine science and technology, the expectation is that the Blue Silicon Valley will be a driving force in the development of the city's blue economy (China Briefing 2014). In 2018, the GDP of "One Valley and Two Areas" accounted for about 40% of Qingdao City's GDP (Piao 2019). It is clear that the blue industrial base has become the most important engine for Qingdao City's economic development.

On 6 August 2018, China Central Television (CCTV) reported Qingdao's marine development and highly evaluated its development mode, which was to build a "high-tech blue silicon valley" based on its strength in marine industries. One example that it gave was the Qingdao National Laboratory of Marine Science and Technology. The central government approved the laboratory, and it started its operation in 2015. In June 2018, President Xi visited the laboratory and stressed that the marine economy and marine technology constituted an important area on which the country was embarking.

How can studies evaluate the effect of industrial clusters on the blue economy? The importance of measuring the economic performance of ocean-based industries is becoming increasingly apparent to public policy makers and private decision makers alike (OECD 2019). A new wave of "industrialization" of the ocean and coasts is underway, the scale of which is only now becoming apparent (The Economist 2015). To grasp the opportunity of "blue industrialization," countries need to rethink the industrial distribution and industrial strategy in their marine economy. The SP-BEZ has been successful largely because it has the clear goal of building industrial clusters and has always tried to optimize the industrial distribution.

The SP-BEZ has also enhanced the development of the regional economic integration within Shandong Province and the surrounding cities. In the PRC, in recent years, there has been a trend of domestic regional integration. This so-called domestic regional integration means economic integration at the domestic level. For example, there are economic blocs, such as the Yangtze River Delta, Zhu River Delta, and Beijing–Tianjin–Hebei region, in the PRC. Recently, the country has also developed the bay area along Guangdong, Hong Kong, China, and Macau, China. Such a trend is apparent in the Shandong Peninsula due to the industrial cooperation among different cities. This domestic regional economic cooperation and integration will further strengthen the region's brand of marine industries.

## **5. CONCLUSION AND POLICY RECOMMENDATION**

The blue economy or marine economy has become increasingly important for countries not only to generate a new source of growth but also to ensure the coexistence of humans and the environment. The PRC has attached great importance to the blue economy since the beginning of the 21st century. During the past two decades, the PRC's development of the blue economy has made great achievements. The blue economy's share in the GDP has increased substantially and remained large. The blue economy has become a national strategy, though traditionally the PRC has not relied heavily on marine resources. The PRC's approach to the blue economy has also experienced transformative change during the past decade. In the policy directives and at the practical level, ecological sustainability and marine environmental protection have already become an important part of the blue economy in the PRC.

The paper argues that government policy and industrial clusters are the two most important factors contributing to the development of the PRC's blue economy, as the case study of the SP-BEZ demonstrated. First, government policy is the basis for the establishment and development of the SP-BEZ. The PRC's government has provided policy guidance and assistance for the development of the blue economy. Both the central and the municipal governments have sponsored the SP-BEZ project by providing substantial financial and technological support. The development of blue finance has occurred due to the public-private partnerships in the blue economy that the government has encouraged. For example, the sponsorship of the State Council and the Ministry of Natural Resources allowed the establishment of the China Ocean Development Foundation in 2015. Its members consist of six giant state-owned companies.

Second, industrial clusters are both the means and the ends for the SP-BEZ. To promote the development of the blue economy in the SP-BEZ, the government has made full use of Shandong Peninsula's industrial advantages to redistribute and restructure the industries in the region. The SP-BEZ has formed industrial clusters with the structure of "one center, two polars, three belts, and three groups." The industrial clusters have integrated a wide range of different industries, such as marine biological pharmaceuticals, marine energy, marine engineering, and marine logistics. In the process, the SP-BEZ has attached particular importance to the blue economy's sustainable development, with projects that aim to preserve the marine resources in the region. Thanks to the industrial clusters, regional cooperation and integration have also developed rapidly on the Shandong Peninsula.

The expected policy implications from this study originate from both positive and negative lessons from the evolution of the PRC's blue economy and the SP-BEZ case. The study has demonstrated the importance of government policy and industrial distribution in developing the blue economy. For example, the government should provide guidance and assistance in areas such as finance, facilities, personnel, and resources to promote the blue economy. Industrial redistribution and restructuring should help to enhance the development of the blue economy. Meanwhile, the development of the blue economy should strike a good balance between economic benefits and sustainable development.

Specifically speaking, the study makes the following policy recommendations. First, the government, both the central government and the municipal governments, should produce robust policies that take into account the importance of the blue economy. Policies should also meet the local area's development and ecological needs instead of only considering the factors at the national level. Second, industrial clusters are an effective way to strengthen the effects of different marine industries. The government should help to develop industrial clusters with the support of scientific and technological research and development in marine industries. Third, the government should encourage investments of blue finance, in particular private investment, in the blue economy's industries. As mentioned previously, the government has initiated "blue bonds" in recent years. Countries should actively make policies that encourage banks to take bold action in this area. Fourth, the development model must be different from that of the land economy as the ocean is more vulnerable to pollution than the land. The blue economy should put marine ecological sustainability and environmental protection rather than the development strategy as its priority.

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