

# Blue Economy to Boom Economy: EU's Experience and ASEAN-China's Path

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## Abstract

ASEAN and China have abundant oceanic resources and well-functioning cooperation mechanisms, which lay solid foundation for blue economy collaboration for mutual benefits. Confronted with challenges, especially from the perspective of stakeholders, on one hand, it's necessary to learn good experiences from European Union since EU has done well in blue economy; and on the other hand, it's indispensable to design a suitable solution based on the local conditions and for the sake of long-term sustainability.

## Keywords

Blue Economy, EU's Experience, ASEAN-China's Cooperation

## 1. Introduction

Covering 71% of our globe, the ocean is not only part of our living environment, but also contributes to our daily life and economic growth. For years the concept of Blue Economy has been accepted as global consensus, and theoretically World Bank defines it as sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health, while in reality different regions may turn to different practices (World Bank & United Nations Department of Economic and Social Affairs, 2017).

For the past decade, blue economy has drawn more and more attention from international institutions, e.g., European Commission (2013), World Wide Fund for Nature (2015), United Nations Economic Commission for Africa (2016), World Bank & United Nations Department of Economic and Social Affairs (2017), OECD (2019), etc. Since the significance of blue economy has been recognized worldwide, the critical issue is therefore how to implement blue economy in practice and make it beneficial for specific economies. With abundant

marine resources, ASEAN and China can cooperate well in the new field of blue economy, on one hand, to learn international experiences from EU, and on the other hand, to work out their own path based upon local features.

## 2. EU's Experience in Blue Economy

As part of “European Green Deal”, blue economy not only draws great attention, but also makes achievements in practice. Since 2018, EU annually publishes “EU Blue Economy Report”, in which EU describes the statistics, plans and actions.

### 2.1. Long-Term Planning and Continuous Attention

EU's attention to blue economy can trace back to 2005, although it was not an independent topic at that time. Then in 2007, marine issue was discussed separately. Up to now, EU not merely pays attention to blue economy, but much more importantly lays great emphasis upon sustainability, and **Table 1** demonstrates the timeline.

### 2.2. Accurate and Professional Statistical Analysis

It's never an easy task to develop a new industry/economy, unless there are enough and adequate data for analysis, and of course data collection itself is not so easy. EU is constantly making efforts in statistics in blue economy. After comparison of EU Blue Economy Reports from 2018 to 2022, it is noticeable that more indicators with more accuracy are provided, which is shown in **Table 2**.

Only in statistics, can we understand what are the present situations, advantages and weaknesses. And only after statistical analysis, can the policy-makers make a feasible plan for the future.

Besides, at the background of global value chains, it is also important to measure the added value in blue economy. Only if efficiency (value added at factor cost) is measured correctly and improved well, can blue economy achieve sustainability. With value added at factor cost measured in **Figure 1**, it is obvious that costal tourism ranks 1<sup>st</sup> for EU.

**Table 1.** Timeline for EU's sustainable blue economy.

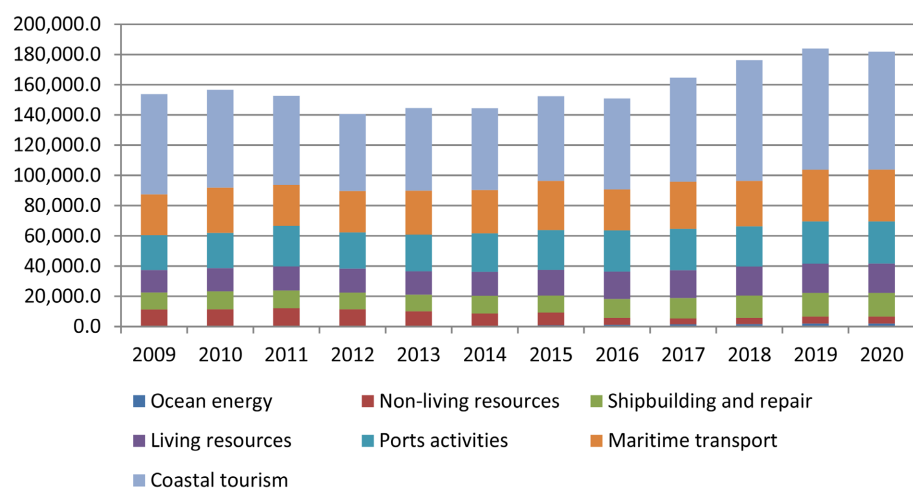
Year	Policy/Document
2021	A new approach for a sustainable blue economy in the EU, Transforming the EU's blue economy for a sustainable future.
2014	Innovation in the blue economy: realising the potential of our seas and oceans for jobs and growth.
2012	Blue growth—opportunities for marine and maritime sustainable growth.
2007	An integrated maritime policy for the European Union.
2005	Strategic objectives 2005-2009 Europe 2010: a partnership for European renewal prosperity, solidarity and security.

Source: European Commission, 2021.

**Table 2.** Development of established sectors in EU blue economy.

	2018	2019
Turnover	€650 billion	€667.2 billion
Gross value added	€176 billion	€183.9 billion
Gross profit	€68 billion	€72.9 billion
Employment	4.5 million	4.45 million
Net investment in tangible goods	€6.4 billion	€6.1 billion
Net investment ratio	3.6%	3.3%
Average annual salary	€ 24,020	€ 24,739

Source: European Commission, 2022.



Source: European Commission, Blue indicators online dashboard, [https://blue-economy-observatory.ec.europa.eu/dashboard-0\\_en](https://blue-economy-observatory.ec.europa.eu/dashboard-0_en).

**Figure 1.** Value added at factor cost by sector for EU blue economy (€million).

### 2.3. Specific Contributions at Present with Future's Prospect

According to EU Blue Economy Report 2022, the Gross Domestic Product (GDP) of the EU-27 was estimated at €14 015 billion and employment at 193.6 million people in 2019. The contribution of the Blue Economy established sectors to the EU-27 economy in 2019 was 1.5% in terms of Gross Value Added (GVA) and 2.3% in terms of employment. **Figure 2** shows that coastal tourism makes the biggest contribution to social employment.

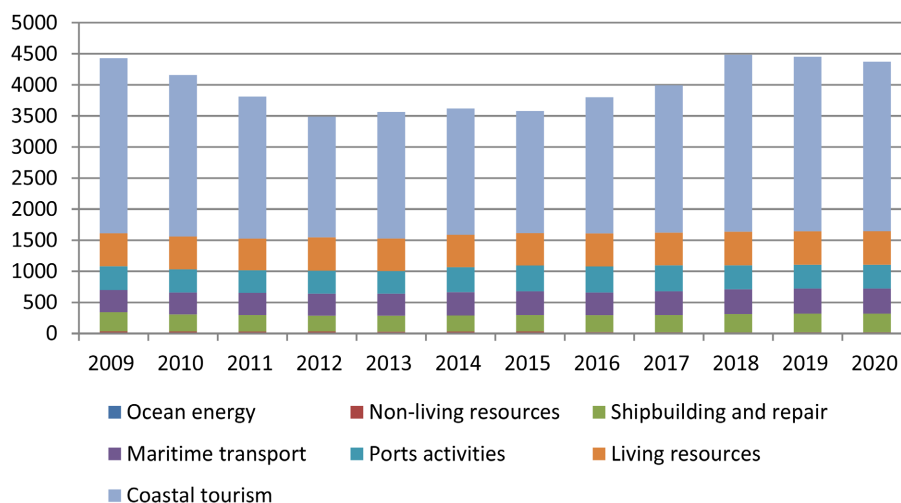
Although blue economy is not the major driver for economic growth and social employment, yet it is not only environmental-friendly, but also promising with huge potentials. So resources are constantly put in, and EU views this potential issue with great patience.

### 2.4. Advantages at Present and Potentials in the Future

Sustainability means on one hand coordinating economic, social and environmental issues, and on the other hand cultivating advantages and potentials for

the future. EU has already established some marine sectors, including marine living resources, marine non-living resources, marine renewable energy, port activities, shipbuilding and repair, maritime transport and coastal tourism.

The established sectors represent EU's comparative advantages at present, which is showed in **Table 3**. In order to take the lead in blue economy, in either



Source: European Commission, Blue indicators online dashboard, [https://blue-economy-observatory.ec.europa.eu/dashboard-0\\_en](https://blue-economy-observatory.ec.europa.eu/dashboard-0_en).

**Figure 2.** Persons employed by sector for EU blue economy (thousand).

**Table 3.** EU's established blue economy sectors.

Sector	Sub-sector
Marine living resources	Primary production
	Processing of fish products
	Distribution of fish products
Marine non-living resources	Oil and gas
	Other minerals
	Support activities
Marine renewable energy	Offshore wind energy
Port activities	Cargo and warehousing
	Port and water projects
Shipbuilding and repair	Shipbuilding
	Equipment and machinery
Maritime transport	Passenger transport
	Freight transport
	Services for transport
Coastal tourism	Accommodation
	Transport
	Other expenditure

Source: European Commission, 2022.

statistical figures or international norms, EU also attaches more importance to emerging sectors with high-technology in this field. **Table 4** indicates the promising sectors in blue economy for EU.

### 2.5. Persistent Financial Support with Diversified Sources

Since 2019, EU has fostered blue economy through “BlueInvest”. It provides support to innovative Small and Medium-sized Enterprises (SMEs) and start-ups active in the blue economy sectors, through its online community, investment readiness assistance, matchmaking, investor outreach and engagement, its academy, projects pipeline and BlueInvest Fund.

Besides, since blue economy is not only time-consuming, but also capital-demanding, and moreover with possible risks, it’s indispensable to attract investments from as more sources as possible. EU’s success in blue economy also partly attributes to diversified finance, which is demonstrated in **Table 5**.

Given the diversification of different member states, not only investments put into blue economy differ from country to country, but also the development of blue economy in each country differs a lot.

**Figure 3** shows the scales of investments in blue economy by EU member states, and therefore it is easy to understand high output based on high input for

**Table 4.** EU’s emerging blue economy sectors.

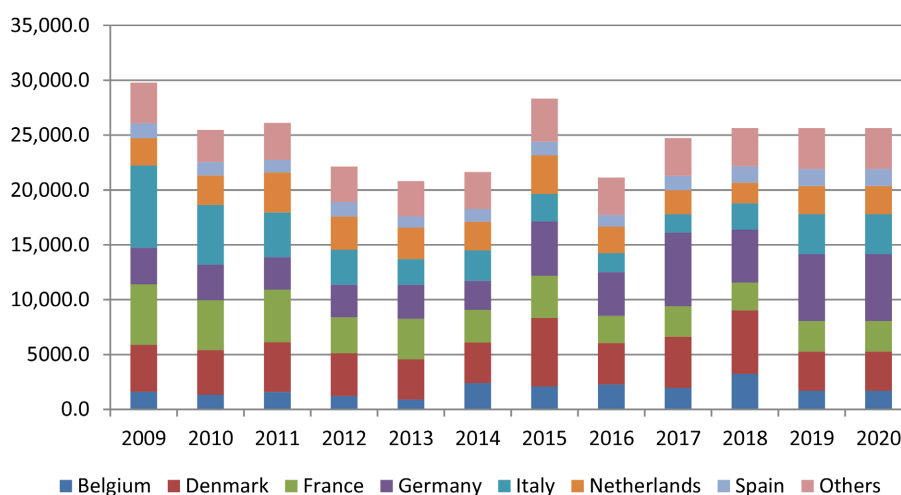
Sector	Details
Ocean Energy	Floating offshore wind
	Tidal and wave energy
	Floating Solar Photovoltaic Energy
	Hydrogen Generation offshore
Blue Biotechnology	Algae
	Biorefineries
	Offshore aquaculture
	Integrated Multi-Trophic Aquaculture
	Cultivation of less exploited species
Desalination	Cellular mariculture
	Reverse osmosis
	Electrodialysis
Maritime defence, security and surveillance	Nanofiltration
Research & innovation	Horizon Europe 2020
Infrastructure	Submarine Cables
	Maritime Tech and robotics

Source: European Commission, 2022.

**Table 5.** Breakdown of funds for ocean energy 2017-2021 (€ million).

Source	Funding Contribution	Total Project Costs
ERDF	257.6	363.2
EU	469.7	791.5
Ocean-ERANET	13.5	18.6
National	508.7	521.2
Regional	578.8	648.1
Total	1828.3	2342.6

Source: European Commission, 2022.



Source: European Commission, Blue indicators online dashboard, [https://blue-economy-observatory.ec.europa.eu/dashboard-0\\_en](https://blue-economy-observatory.ec.europa.eu/dashboard-0_en).

**Figure 3.** Gross investment in blue economy by EU member states (€million).

specific economies.

### 3. Advantages of ASEAN-China in Blue Economy

Located in Asia-Pacific area, ASEAN and China rely largely on the ocean, not only because of the natural resources and living environment, but also because of the economic and social contributions, since many countries are outward-oriented economies (Whisnant & Reyes, 2015). The cooperation between ASEAN and China in blue economy has a promising future based on the following advantages.

#### 3.1. Abundant Oceanic Resources

In blue economy, ASEAN and China have more potentials than EU, since abundance of oceanic resources has endowed with us comparative advantages. Table 6 shows the abundant resources in blue economy for Asia, and it is the same with ASEAN and China. With only Laos as inland country, ASEAN and China have long coastline, which enables us to cooperate well in range of multiple areas.

**Table 6.** Abundant resources and great potential for blue economy in Asia.

Area	Comparative advantages and statistical evidence
Fisheries & aquaculture	8 of the world's top 15 fish producing countries are in East Asia, with exports valued at \$136 billion. Asia accounts for 84% of all people employed in the fisheries and aquaculture sector worldwide and 68% of the global fishing fleet. By 2030 Asia could consume 70% of fish globally.
Ports, shipping & marine transport	5 out of the world's top 6 shipping economies are located in East Asia, along with 9 of the top 10 busiest container ports.
Tourism, resorts & coastal development	80% of all tourism takes place in coastal areas. International tourism in Asia-Pacific has shown strongest growth than other parts of the world.
Oil & gas	Asia's demand for energy is expected to increase 40% by 2022. Globally, offshore fields could account for 34% of worldwide crude oil production by 2025. Asia will be the primary global buyer of liquefied natural gas (LNG) in the coming decade, requiring substantial coastal infrastructure.
Coastal manufacturing	Asia accounts for nearly half of all global manufacturing output. The ASEAN region accounts for 7% of global exports, making it the fourth-largest exporting region in the world. The top 5 shipbuilding countries in the world are all in East Asia.
Seabed mining	The ocean floor contains economically valuable mineral deposits. Some deep sea deposits contain ores with up to 10 times the proportion of metal compared to deposits found on land.
Renewable energy	Technically exploitable marine-based renewable sources hold the potential to more than meet all current global energy needs.
Marine biotechnology	The demand for marine pharmaceuticals is anticipated to grow to \$8.6 billion by 2016. China, Malaysia and the Philippines consider marine biotechnology in investment strategies and growth plans.
Marine technology & environmental services	A significant market need exists for companies providing marine technology and environmental services. For example, wastewater treatment technology and services are needed to address the 65% of all sewage in Asia which is dumped into the ocean without any treatment. IT-enabled solutions are needed for combating IUU fishing, an issue costing an estimated \$23.5 billion annually.

Source: PEMSEA, 2022.

### 3.2. Sound Economic Cooperation Mechanism

On the basis of long history of friendly relationship, ASEAN and China not only establish mutual trust, but also enhance collaboration through sound cooperation mechanism. There are dialogues and forums to discuss common issues peacefully and equally, and regional agreements to lawfully regulate practices and cooperation. More importantly, ASEAN-China partnership on Blue Economy was set during the ASEAN Summit in 2021. This macro-plan not only means consensus for the two parties, but also will yield mutual benefits based on practical actions in the future. **Table 7** demonstrates the good economic cooperation mechanism between ASEAN and China, which enhances confidence for cooperation in blue economy.

### 3.3. Good Economic Relations

The blue economy cooperation between ASEAN and China is convincing, since

in international economic areas, ASEAN and China are each other's excellent partners, in either international trade, or Foreign Direct Investment (FDI), or international contracted projects.

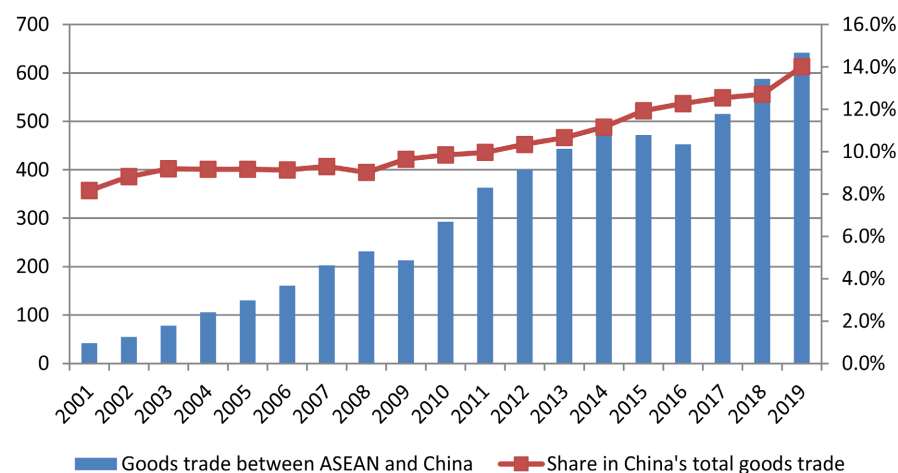
In essence, blue economy is one aspect of economy, including not merely fishery's trade, investment in oceanic tech, ports' contracted projects, etc. Therefore, good economic relations between ASEAN and China will undoubtedly further boost cooperation in blue economy. **Figures 4-6** prove the good relationship between ASEAN and China in specific trade, FDI and project contracting areas.

In trade area, database from National Bureau of Statistics of China shows that China has been ASEAN's largest trade partner for 13 consecutive years since 2009, while ASEAN became China's largest trade partner in 2020. With the upward tendency in merchandise trade, it is anticipated to achieve constant increase in unified fishery market within the region.

**Table 7.** Sound economic cooperation mechanism between ASEAN and China.

Types of cooperation	Specific arrangements
Dialogue/negotiation	ASEAN-China Summit
	ASEAN Plus Three Summit
	East Asia Summit
	ASEAN Regional Forum
	Belt and Road Initiative
Laws and regulations	Framework Agreement on Comprehensive Economic Cooperation between ASEAN and China
	Regional Comprehensive Economic Partnership Agreement
Focus on blue economy	ASEAN-China partnership on Blue Economy

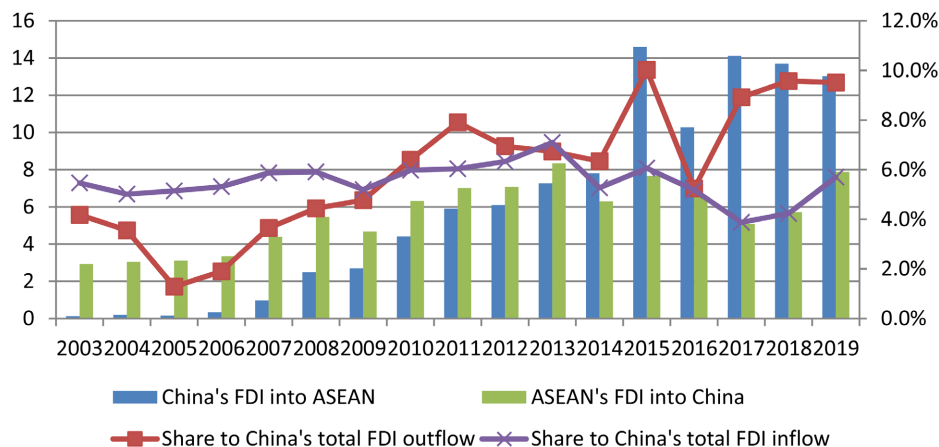
Source: Author's compilation.



Source: National Bureau of Statistics of China, 2020.

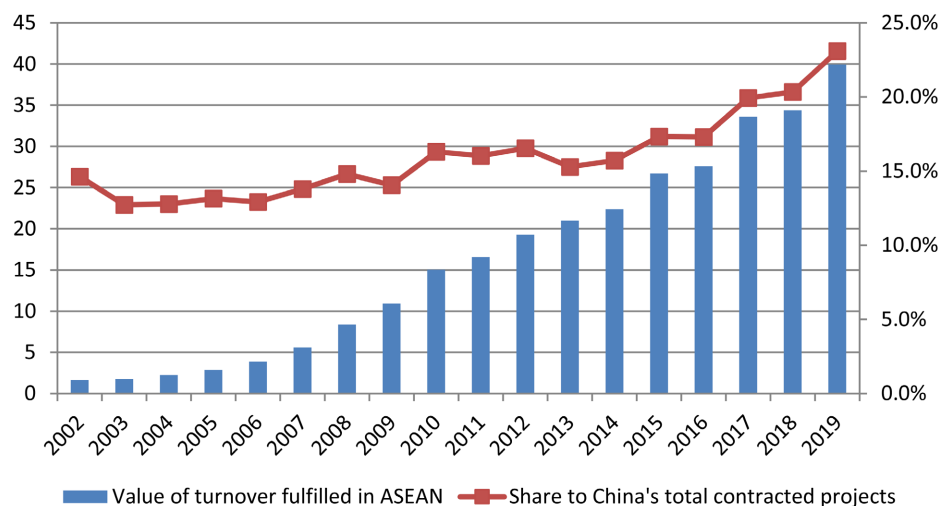
**Figure 4.** Trade cooperation between ASEAN and China (billion US \$).





Source: National Bureau of Statistics of China, 2020.

Figure 5. FDI cooperation between ASEAN and China (billion US \$).



Source: National Bureau of Statistics of China, 2020.

Figure 6. Project contracting cooperation between ASEAN and China (billion US \$).

FDI flows between ASEAN and China provide indispensable capitals for economic development, and some investments will contribute to the blue economy if guided. Besides, since Belt and Road Initiative (BRI) was proposed in 2013, Chinese construction firms have undertaken many contracted projects in ASEAN countries, and many of the projects contribute to infrastructure connectivity, which is great impetus for cooperation in blue economy.

### 3.4. Industrial Cooperation Based upon Cultural Communications

Based on the abundant marine resources in ASEAN and China, at least these areas are major industries for cooperation, including fisheries and aquaculture, ports and marine transport, tourism and coastal development, and costal manufacturing and ocean tech.

Cultural similarity and intraregional communication are also instrumental for cooperation in blue economy. For instance, a Chinese movie “Lost in Thailand”

in 2012 has brought millions of Chinese visitors into Thailand. ASEAN and China are not only neighboring economies, but also share many things in common, which will naturally lead to better understanding and deeper cooperation.

#### 4. Challenges in Engagement of Stakeholders

There are some challenges in blue economy, including not merely unsustainable extraction from marine resources such as unsustainable fishing, physical alterations and destruction of marine and coastal habitats and landscapes, marine pollution, impacts of climate change, etc. (Rajni, 2016). These actions can be summarized as unsustainability, especially over-exploitation and pollution.

In order to make the blue economy sustainable, it's urgent to get stakeholders involved in. However, in practice the participation of all parties is challenging, since it's not an easy task to coordinate short-run economic benefits and long-term comprehensive gains.

Public private partnership (PPP) model may provide a possible solution. Although blue economy is time-consuming and capital-demanding, yet we can never rely everything upon governments, or governments can never do everything once for all. If governments provide all the capitals to invest in blue economy, on one hand huge investments expend too much, not good for fiscal revenue, and on the other hand it may also be inefficient for lack of professional market players. PPP means cooperation of the governments and enterprises to co-invest, which has been proved to be successful in many infrastructure constructions in Asian countries. It's deemed to be also suitable in blue economy, for not only governments but also financial institutions and more enterprises can participate and cooperate, bringing not only diversified investments but also professional business management.

In essence, firms are key players in blue economy, so another possible solution lies in firms' responsible actions in practice, namely ESG and CSR. ESG (environmental, social and governance) was firstly proposed in "Who Cares Wins" by International Finance Corporation in 2004. ESG urges firms to care about issues other than financial earnings, which have something in common with CSR (corporate social responsibility). Blue economy is based upon business, but far beyond business, and thus ESG and CSR should also be guided in this new and promising area. At present the thoughts and actions of ESG and CSR still need to be strengthened within the Asia-Pacific region, and it would be much better if more attention could be paid to blue economy. Not only economic, but also social and environmental issues should be covered; not only governments, enterprises and financial institutions should play a part, but also communities and non-government organizations (NGOs) should take actions, so blue economy needs ESG and CSR.

#### 5. Suggestions and Prospect

Although blue economy accounts for a small portion in GDP and employment, yet in economics it's promising, and for society it's sustainable. So how to en-

hance cooperation and make it beneficial is pressing for ASEAN and China.

### **5.1. Far-Reaching Planning**

Since we already have ASEAN-China partnership on Blue Economy as the macro-plan, the next step is to carry on the consensus and make it concrete, and there is urgent need for a comprehensive far-reaching plan.

First, to view blue economy globally and locally. Blue economy in the world has some experiences to learn from, but only if the issue is considered on the basis of local features in the Asia-Pacific region, can we make persistent progress in the long term. So the best is to adjust measures to local conditions, and develop blue economy with Asian features (Bhattacharya & Dash, 2020).

Second, to stick to centrality of ASEAN. ASEAN has been proved to be successful in regional cooperation, and centrality of ASEAN is critical to resolve many Asian issues. Cooperation in blue economy is of course implemented through equal and fair negotiation, and China will definitely shoulder more responsibilities according to the economic size, but centrality of ASEAN is much more important. Experiences of ASEAN can be fully utilized within the region, which is more suitable for regional cooperation, and of course in the field of blue economy.

Third, to design for future. It's crucial to turn the abundant oceanic resources into present advantages and potential benefits. From EU's experience, the status quo is important, but emerging industries and prospective areas mean much more. Therefore, on one hand it is required to seek truth from facts, improve statistical analysis and comprehensively grasp the actuality of blue economy in ASEAN and China; on the other hand, based on statistical anticipation and industrial prospection, it is necessary to make good preparations and plan for the future. Only if we bolster future's competitiveness in blue economy, can it maintain sustainable.

Last, to care for environment. As to environmental protection and oceanic sustainability, plans and actions can be well conducted by China-ASEAN Environmental Cooperation Center, which was proposed in the 11<sup>th</sup> ASEAN-China Summit in 2007 and later inaugurated in 2011. In 2021, ASEAN and China jointly approved The Framework of ASEAN-China Environmental Cooperation Strategy and Action Plan 2021-2025, with focus on environmental policy dialogue and capacity building, sustainable cities and marine plastics reduction, climate change and air quality improvement, biodiversity conservation and ecosystem management. Practical actions include China-ASEAN Marine Life Corridor Construction Cooperation Project, ASEAN-China Mangroves Conservation Partnership, and Marine Plastics Reduction Action, etc.

### **5.2. Blue Economy Corridor and Infrastructure Connectivity**

Only in connectivity can blue economy develop well, and only with infrastructure can ASEAN and China cooperate well in blue economy.

Experiences in China show that build roads before you get rich. China for

many years develops the infrastructure well, and thus enjoys economic development at the growth rate similar to high-speed rail. With BRI since 2013, China has introduced the experience of infrastructure connectivity to the globe, which benefits more nations and more people.

Referring to blue economy, ASEAN and China also need infrastructure connectivity. Fishery and aquaculture need unified market within the region and connectivity to facilitate and conclude trade, and it's the same for ocean transportation, costal tourism and other areas in blue economy. Therefore, based on the importance of infrastructure connectivity, blue economy corridor would be a reasonable attempt. Infrastructure construction and connectivity is fundamental, and policy coordination within the corridor would be indispensable supplement. Some cooperation projects can be selected as flagship examples, to make it convincing and extend regional publicity.

### 5.3. Technology Hub for Cooperation

For ASEAN and China in the field of blue economy, technology is the future. ASEAN and China should continuously invest in R&D in blue economy, and moreover, China not only has the ability but also is willing to share the oceanic tech. Therefore, ASEAN and China should focus on the cutting-edge marine tech and design specific mechanism for co-research and knowledge-sharing.

Great chance first lies in blue carbon or ocean carbon sink. For many years green carbon or forest carbon sink is the major force or the only option. But considering big challenge of carbon neutrality, blue carbon will be a better choice with huge potentials, because the world and especially Asia has abundant ocean resources. In this sense, oceanic technology in blue carbon is promising and needs commitment.

Another cutting-edge tech lies in desalination, especially the RO (reverse osmosis) method. Not only ASEAN and China have abundant ocean resources, but also many Asian countries including China have mastered the advanced tech. Between 2003 and 2016, RO technology was the subject of 51% of R&D innovation in the field of desalination, based on patenting activity. Furthermore, Asia's contribution to global R&D on reverse osmosis is extraordinarily huge, with CJK (China, Japan and Republic of Korea) filing for 83% of the inventions, while China ranks No. 1 with share of 45% (European Commission, 2022).

Based on the comparative advantage in ocean resources, ASEAN and China should on one hand focus on the cutting-edge technology in blue economy, and on the other hand establish technology hub for knowledge sharing and economic cooperation.

### 5.4. Blue Finance for Sustainability

There are already some financial arrangements related to blue economy. In 2011, China-ASEAN Marine Cooperation Fund was launched, which is designed to promote cooperation in oceanic economy, marine connectivity, oceanic tech and

environmental protection. Asian Infrastructure Investment Bank (AIIB) has also invested some projects in the field of blue economy, and Mandalika Urban and Tourism Infrastructure in Indonesia is a typical example. Within the Action Plan for Healthy Oceans and Sustainable Blue Economies, Asian Development Bank (ADB) in 2019 launched ADB Blue Pacific Finance Hub, which makes commitment to increase ocean investments in Asia-Pacific to \$5 billion between 2019 and 2024 (Yoshioka et al., 2020). In April 2022, ADB launched the world's first Blue Bond Incubator, which is an innovative finance mechanism and raises debt to fund ocean projects.

Just as shown in EU's case, blue economy for ASEAN and China also needs more finance from diversified sources for sustainability. So it's necessary to cooperate with national, regional and multilateral financial institutions. If possible, it would be much better to establish ASEAN-China Blue Fund, since financial support in professional way would make blue economy much easier.

Besides, financial transactions can also facilitate blue economy. In 2021 China introduced Xiamen Ocean Carbon Sink Exchange Platform. In 2022, China was further determined to establish Hainan International Carbon Emissions Rights Exchange Center. These two exchange platforms can be utilized not only by China domestically but also within the region.

### 5.5. Blue Industrial Zones

Up to now, China has established many overseas industrial zones. In the future, we can either add factors of blue economy to the existing industrial zones for further cooperation, or establish blue industrial zones with specific emphasis on blue economy.

**Table 8** shows that there are 10 overseas industrial zones in 7 ASEAN member

**Table 8.** China's overseas industrial zones in ASEAN.

Country	Name of Industrial Zones
Cambodia	Sihanoukville Special Economic Zone
Thailand	Thai-Chinese Rayong Industrial Zone
Vietnam	Long Jiang Industrial Park China-Vietnam (Shenzhen-Haiphong) Economic and Trade Cooperation Zone
Indonesia	China-Indonesia Economic and Trade Cooperation Zone (Kawasan Industri Terpadu Indonesia China) PT Indonesia Morowali Industrial Park Julong Agricultural Cooperation Zone
Laos	Vientiane Saysettha Development Zone
Malaysia	Malaysia-China Kuantan Industrial Park
Brunei	Pulau Muara Besar Industrial Park

Source: Author's compilation.

countries, which lay the root for further cooperation in blue economy. To enhance the blue issue progressively, first we can select some oceanic projects for experiments in the existing industrial zones, and later we can designate some region exclusively for blue economy. Within blue industrial zones, preferential policies and privilege would be given to foster oceanic R&D, oceanic high-tech and costal manufacturing.

## 6. Conclusion

Referring to blue economy, ASEAN and China have undoubtedly promising future, but the critical issue is how to transform the advantages and potentials into long-term and comprehensive gains. We can learn experiences from EU, but what we plan to do and implement in practice should consider our local unique characteristics (Birtill et al., 2022). Under the guideline of ASEAN-China partnership on Blue Economy, we should make macro plan and take micro actions, carry on economic cooperation and maintain friendly communication, build blue economy corridor through infrastructure connectivity, pursue frontier technology through co-research and knowledge-sharing, diversify finance together with specifically designed blue fund, and foster blue economy through blue economic zones. On the basis of consensus in blue economy and ASEAN's centrality, deep cooperation will definitely bring mutual benefits for both parties. And for far-reaching prospect, blue economy should always be open, inclusive and sharing.

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## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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