

Economic Impacts of Global Climate Change on Coastal Areas and Coping Strategies from the Perspective of Ocean Economy

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Abstract: The phenomenon of climate change has an important impact on global economic development, and coastal areas are the first to feel the threat of “climate change”. As global warming continues to intensify, the environment in which people live will gradually deteriorate, and the fragile natural resources and ecological environment of China's coastal areas are extremely vulnerable to the impact of climate change, so the study of strategic responses to climate change in the coastal areas is of far-reaching significance. With the background of global climate change, this paper analyzes the impacts of climate change on resources and energy, environment and economy of coastal areas from the perspective of marine economy. Taking China's coastal areas as an example, the paper discusses how to cope with the challenges brought by global climate change. It is expected to provide a reference for the high-quality green development of coastal area economy.

Keywords: Climate change; Coastal areas; Marine economy; Economic development.

1. Introduction

Global climate change has become a common challenge for all countries in the world, and its impacts are far-reaching and widespread, threatening not only the stability of ecosystems and biodiversity, but also seriously affecting the economic activities and lifestyles of human societies. Especially for coastal areas, the impacts of climate change are more direct and significant. Most of the economic activities in coastal areas are concentrated in fishery, tourism, port transportation and other marine-related industries, which are directly affected by climate change, such as sea level rise and the increase of extreme weather events, thus affecting economic growth, the quality of life of the residents and social stability. Therefore, it is of great practical significance to thoroughly study the impact of global climate change on the economy of coastal areas and its coping strategies.

Starting from the perspective of marine economy, this study analyzes the impacts of global climate change on the economy of coastal areas and its coping strategies, aiming to provide scientific theoretical support and policy recommendations for economic development and climate change adaptation in coastal areas, which is of great theoretical value and practical significance for promoting the green and low-carbon development of the global economy.

2. Overview of Climate Change and Economic Development in Coastal Areas

2.1. Analysis of Climate Change Situation in Coastal Areas

Climate change in coastal areas is a complex and many-sided issue. It affects the local ecological environment. It also has a direct relation to economic development and social stability.

In recent years, temperature rise is the main factor of climate change in coastal areas. Sea level rise comes next. There is also an increase in extreme weather events. These

factors have led to a more and more serious climate change problem in coastal areas. An in - depth analysis of the specific impacts of these factors is of great importance. It helps in formulating effective coping strategies.

2.2. A Look at Economic Development in Coastal Areas

In the context of global climate change, comparing the economic development levels of coastal areas is very important. Coastal areas usually have rich marine resources. They also have unique geographical advantages. But they face challenges. These include frequent natural disasters and a fragile ecological environment. This section will show the development differences. It will also look at the reasons behind these differences by comparing economic development levels of different coastal areas.

Table 1. Comparative levels of regional economic development

Region	GDP (USD billion)	GDP per capita (USD)	Share of marine economy (%)
East Asia	1200	5000	15
Western Europe	800	20000	20
North America	1500	60000	25
South America	400	3000	10

As seen from the table, different regions have significant differences in economic development levels. North America has the highest GDP per capita. This shows its higher economic development level and quality of life. East Asia, however, has a relatively low GDP per capita. This is despite its larger total GDP. It shows that economic growth relies more on the demographic dividend. It does not rely much on technological or efficiency improvements.

Looking at how coastal regions develop economically shows the differences between areas. These differences are not only reflected in the economic indicators, but also reflect the strategies and effectiveness of each region in the utilization of marine resources, environmental protection,

technological innovation and other aspects. Therefore, it is of great significance to formulate corresponding development strategies for the characteristics of different regions in order to promote the sustainable development of coastal areas.

The marine economy is an important economic pillar of coastal areas. The distribution of its industries directly affects regional economic development. It also affects environmental sustainability. The impact of global climate change on marine economy industries has become more and more significant. Countries have formed different marine economy industrial structures. They do this based on their own resource endowment and economic development stage [1].

When analyzing the distribution of marine economic industries, several major aspects can be looked at. These are marine energy development, marine fishery, marine tourism, marine transportation, and marine scientific research. These industries are an important part of coastal economic development. They are also a key area for coping strategies under global climate change [2].

Table 2. Key areas of the marine economy industry

Industry category	2010 output value (USD billion)	2020 output value (USD billion)	Growth rate (%)
Marine energy development	120	180	50
Marine fisheries	30	45	50
Marine tourism	150	220	46.7
Marine transportation	200	300	50
Marine scientific research	80	160	62.5

Against the backdrop of global climate change, marine economy industry development has started to transform. It is moving toward a more diversified and high - tech direction.

The economic impacts of climate change on coastal zones are many. They include reduced productivity, more pressure for industrial restructuring, and changes in trade patterns. These impacts affect local economic development. They also have far - reaching effects on the global economy.

Productivity decline is mainly seen in two areas: agriculture and fisheries. In coastal areas, these are important economic pillars. Extreme weather events from climate change, like floods and droughts, directly affect crop yields and quality. Also, sea - level rise and higher sea temperatures damage marine ecosystems. This affects the sustainability of fishery resources. For example, rising sea temperatures may change migration patterns of some fish species. This affects fishermen's fishing seasons and fishing efficiency.

Increased pressure on industrial restructuring is mainly seen in impacts on traditional industries. It is also seen in opportunities for new industries. As climate change gets worse, some industries dependent on specific climatic conditions, like tourism and agriculture, may be hit hard. At the same time, climate change makes governments and businesses look for new economic growth sources. These include renewable energy and green technology industries. This shift needs a lot of financial investment and policy support. It aims to optimize and upgrade the economic structure.

Changes in trade patterns are because of global climate change impacts on international trade. Frequent natural disasters from climate change may affect coastal logistics and supply chains. This increases trade costs. Also, climate

change may cause a drop in regional production capacity. It affects the stability of global trade patterns.

The impact of climate change on coastal area economies is all - encompassing. It needs the joint efforts of governments, enterprises, and all sectors of society. They should plan layouts according to local conditions. They need to take effective measures. These measures should mitigate negative impacts. They should also grasp new development opportunities.

3. Breaking Down Climate Change's Economic Effects on Coastal Areas

Climate change has many economic impacts on coastal zones. These include lower productivity, more pressure to restructure industries, and changes in trade patterns. These impacts affect local economies. They also have big effects on the global economy.

Productivity has gone down mainly in two areas: agriculture and fisheries. These are key economic parts of coastal areas. Extreme weather from climate change, like floods and droughts, hits crop yields and quality. Sea level rise and warmer oceans damage marine ecosystems. This hurts the sustainability of fishery resources. For example, warmer seas can change how some fish migrate. This affects when fishermen can fish and how efficient they are.

The pressure to restructure industries shows in two ways. First, traditional industries take a hit. Second, new industries get opportunities. As climate change gets worse, industries that depend on specific climates, like tourism and farming, suffer. At the same time, governments and businesses look for new growth areas. Renewable energy and green tech industries are examples. This change needs a lot of money and policy support to improve the economy.

Trade patterns change because of global climate change. Frequent natural disasters mess with coastal logistics and supply chains. This raises trade costs. Also, climate change can lower regional production ability. This affects the stability of global trade patterns.

Climate change impacts coastal economies in many ways. Governments, businesses, and society need to work together. They should plan based on local needs. They must take steps to cut negative effects and use new opportunities.

4. Coping Strategies for China's Coastal Areas in the Context of Global Climate Change

4.1. Shift to a Green Growth Model for Quality Development

With global climate change happening, China's coastal areas face big challenges and new chances. To handle these challenges and grab these opportunities, changing the development model is a must. This means going for high - quality green development. High - quality green development needs two things. One is balancing economic growth with environmental protection. The other is making big changes in how the economy is structured and grows.

The key to changing the development model is improving the industrial structure. It also means pushing the economy to rely more on knowledge, technology, and new ideas. The research, development and application of green technologies would be a key factor in that process. By improving the efficiency of resource utilization and promoting the use of

clean energy, greenhouse gas emissions can be effectively reduced and the impact of global climate change mitigated.

In order to achieve this goal, several key measures need to be taken:

(1) Strengthening green technology innovation: The Government should increase its investment in green technology research and development, and encourage enterprises and research institutes to develop new technologies and products in order to improve resource utilization efficiency and reduce environmental pollution.

(2) Optimize energy structure: Actively develop renewable energy sources, such as wind, solar and hydropower, to gradually reduce dependence on fossil fuels and lower carbon

$$\text{Environmental benefits} = \frac{\text{Energy saving and emission reduction}}{\text{Total energy consumption}} \quad (1)$$

Through the implementation of the above measures, the development pattern of coastal areas can be effectively transformed to realize a win-win situation for both economic development and environmental protection. This helps tackle global climate change head-on. It also boosts coastal areas' sustainable development. And it makes them more competitive in the global economy.

4.2. Smart Resource Use and Boosting Tech Innovation

In the context of global climate change, China's coastal areas are facing unprecedented challenges. To deal with these challenges, optimizing resource use and boosting tech innovation are key strategies. Optimizing resource use is not just about traditional economic resources. It's also about human resources, information, and technology. Boosting tech innovation, though, is a big driver for economic change and sustainable development.

Resource use optimization can happen in the following ways:

(1) Strengthening infrastructure construction and improving the efficiency of resource utilization. For example, by building intelligent ports and logistics systems, the loss of resources in the transportation process can be reduced.

(2) Implementing green technological transformation to improve energy utilization efficiency. For example, promote the use of clean energy and energy-efficient equipment to reduce carbon emissions.

(3) Optimize the industrial structure and develop a low-carbon economy. By adjusting the industrial layout, promote the development of new industries and gradually phase out high-pollution and high-energy-consumption industries.

The enhancement of scientific and technological innovation capacity is mainly manifested in the following aspects:

(1) Increase investment in R&D and support scientific and technological innovation. The government and enterprises should increase investment in scientific research, especially in climate change adaptation and mitigation technologies.

(2) Strengthen the training and introduction of talents and establish high-level scientific research teams. Attract excellent researchers from home and abroad by providing a quality research environment and incentive mechanisms.

(3) Promote cooperation among industries, universities and research institutes to accelerate the transformation of scientific and technological achievements. Promote the rapid application of scientific and technological innovations through the establishment of a closer cooperative relationship

emissions.

(3) Promote energy-saving and emission reduction measures: Promote energy-saving and emission reduction technologies and equipment in the fields of industry, transportation and construction, and improve the efficiency of energy use in society as a whole.

(4) Implementing environmental policies: formulating and enforcing strict environmental protection policies, penalizing polluting enterprises and incentivizing them to adopt green production methods.

For the effect of changing the development model, the following formula can be used here to make a preliminary assessment:

between industry, academia and research.

4.3. Green Marine Economy Development Strategy

Against the backdrop of global climate change, China's coastal areas are facing unprecedented challenges and opportunities. In order to effectively respond to these challenges and seize the opportunities, it is particularly important to implement a green ocean economy development strategy. This strategy aims to realize a win-win situation between economic growth and environmental protection by promoting the sustainable development of the marine economy [3].

The green marine economy strategy has main parts like this:

(1) Protecting the marine ecosystem more. This makes sure ocean resources can be used sustainably. It means making strict rules for ocean environmental protection. It also means making penalties for illegal actions heavier and at the same time promoting and applying clean production technology to reduce marine pollution.

(2) Develop new forms of marine economy and promote the optimization and upgrading of the marine economic structure. Focus on the development of high value-added industries such as marine biomedicine, marine energy, marine tourism, etc., and enhance the competitiveness of industries through scientific and technological innovation.

(3) Promote marine scientific and technological innovation to improve the overall efficiency and competitiveness of the marine economy. Increase investment in marine scientific research and support the transformation and application of marine scientific and technological achievements, especially in the fields of marine environment monitoring and marine resources development.

(4) Implement international cooperation to jointly address the challenges posed by global climate change. Share the fruits of marine science and technology through participation in international ocean affairs, and coordinate solutions to transboundary marine environmental problems.

The implementation of the green ocean economy development strategy is of great significance in promoting the sustainable development of the coastal area economy. In the future, with the advancement of technology and the improvement of policies, the green ocean economy will become a new engine to promote global economic growth [4].

5. Conclusion

Through an in-depth analysis of global climate change and its impact on the coastal region economy, this study reveals

the multidimensional impact of climate change on the coastal economy, as well as the necessity and implementation paths of the coastal region's coping strategies in this context. Study results show climate change hits coastal natural resources and ecosystems directly. It also affects the local economy, industries, and how the economy grows. This brings a complex and long-term impact on coastal economic development.

After looking at climate and economic situations in coastal areas, this paper finds climate change signs there. These are sea level rise, ocean acidification, and more. Such changes have big effects on coastal ecosystems and natural resources. They also bring many problems to coastal economic activities. For example, farm yields go down and fish resources get fewer.

Further studies have pointed out that the impacts of global climate change on the coastal zone economy are mainly in three areas: resource energy impacts, environmental impacts and economic impacts. The resource and energy impacts are mainly manifested in the reduction of available natural resources; the environmental impacts mainly include ecosystem destruction and biodiversity reduction; and the economic impacts are related to the increase of production costs and the decrease of export competitiveness.

From the points above, this paper puts forward coping strategies for China's coastal areas in the context of global climate change, including changing the development model, optimizing resource allocation, and promoting the development strategy of green ocean economy. These strategies aim at realizing high-quality green development of coastal areas and enhancing the economic competitiveness and adaptive capacity of coastal areas.

When it comes to changing the development model, it is recommended that China's coastal areas pay attention to optimizing and upgrading their economic structure, developing a low-carbon economy, and strengthening green technological innovation in order to achieve a win-win

situation for both economic development and environmental protection. In addition, optimizing resource allocation implies improving the efficiency of resource utilization through scientific and technological innovation and promoting the construction of a resource-saving society. Finally, the strategy of promoting the development of green marine economy means promoting the sustainable and healthy development of marine economy by strengthening marine ecological protection and rationally exploiting and utilizing marine resources [5].

In summary, the economic impact of global climate change on coastal areas is comprehensive and profound, requiring coastal areas to take effective countermeasures. This includes not only adjustment and innovation at the economic level, but also guidance and support at the policy level. Only in this way can the stable economic development of coastal areas be guaranteed in the context of global climate change and the goal of sustainable development be realized.

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