

Title : Research on the coordinated development of energy, economy, and ecological environment in Guangdong Province from 2000 to 2020

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Introduction

Energy is an important material basis for economic and social development and the progress of contemporary civilization. However, energy and environmental problems brought about by economic expansion are becoming more and more serious. Guangdong Province is an economically developed province along the southern coast of China, with rapid economic development and diversified development methods. To study the relationship and impact between energy, economy and environment, investigate the coordination of energy, economy and ecological environment in Guangdong Province

Research Objectives

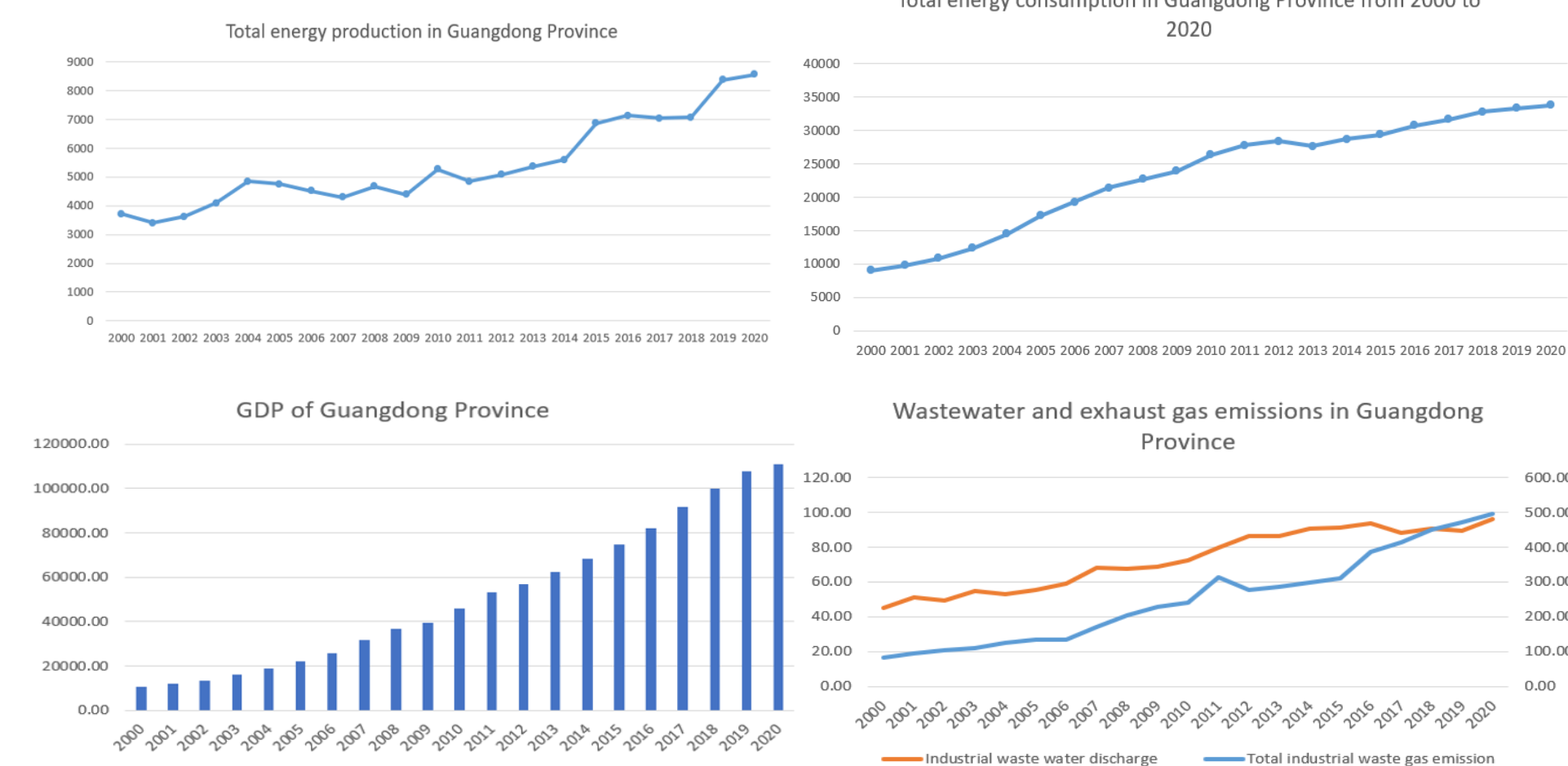
1. To investigate the current situation of energy, economy and ecological environment in Guangdong Province.
2. Demonstrate the mutually reinforcing relationship between energy consumption and economic growth, and whether the environment constrains economic development and energy consumption
3. Based on comprehensive survey data and hypothesis analysis, summarize and propose solutions for the coordinated growth of energy, economy and ecological environment in Guangdong Province.

Methodology

1. Building a VAR model for Guangdong Province's energy, economic and environmental systems.
2. Perform unit root and Granger causality tests.
3. Create impulse response functions to analyse how variables interact.

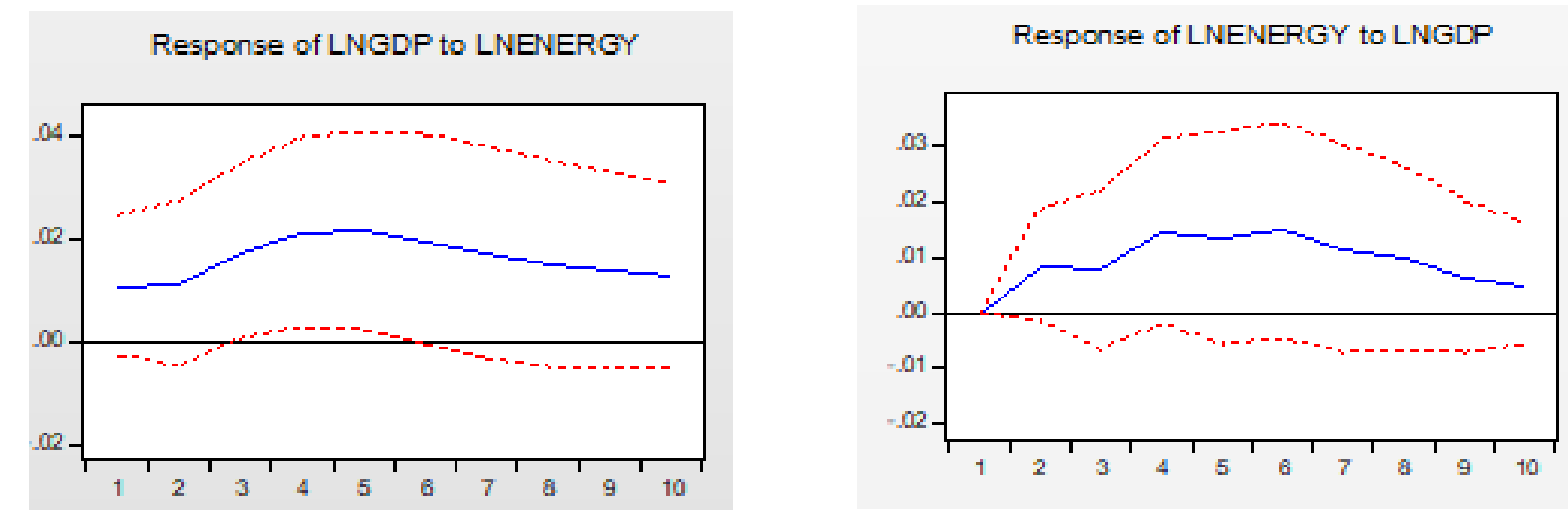
Situation Analysis

From 2000 to 2020, the total energy production and total energy consumption in Guangdong Province have continued to rise. From 2000 to 2020, Guangdong's GDP showed a continuous growth trend, with an average annual growth rate of around 8%. The GDP of Guangdong Province is positively correlated with the total energy consumption. As shown in Figure 8, with the growth of GDP, the total energy consumption of Guangdong Province also increased. The status quo of the ecological environment in Guangdong Province needs to be improved, and the discharge of wastewater and exhaust gas has been slowly increasing. Only a few years saw a decrease.

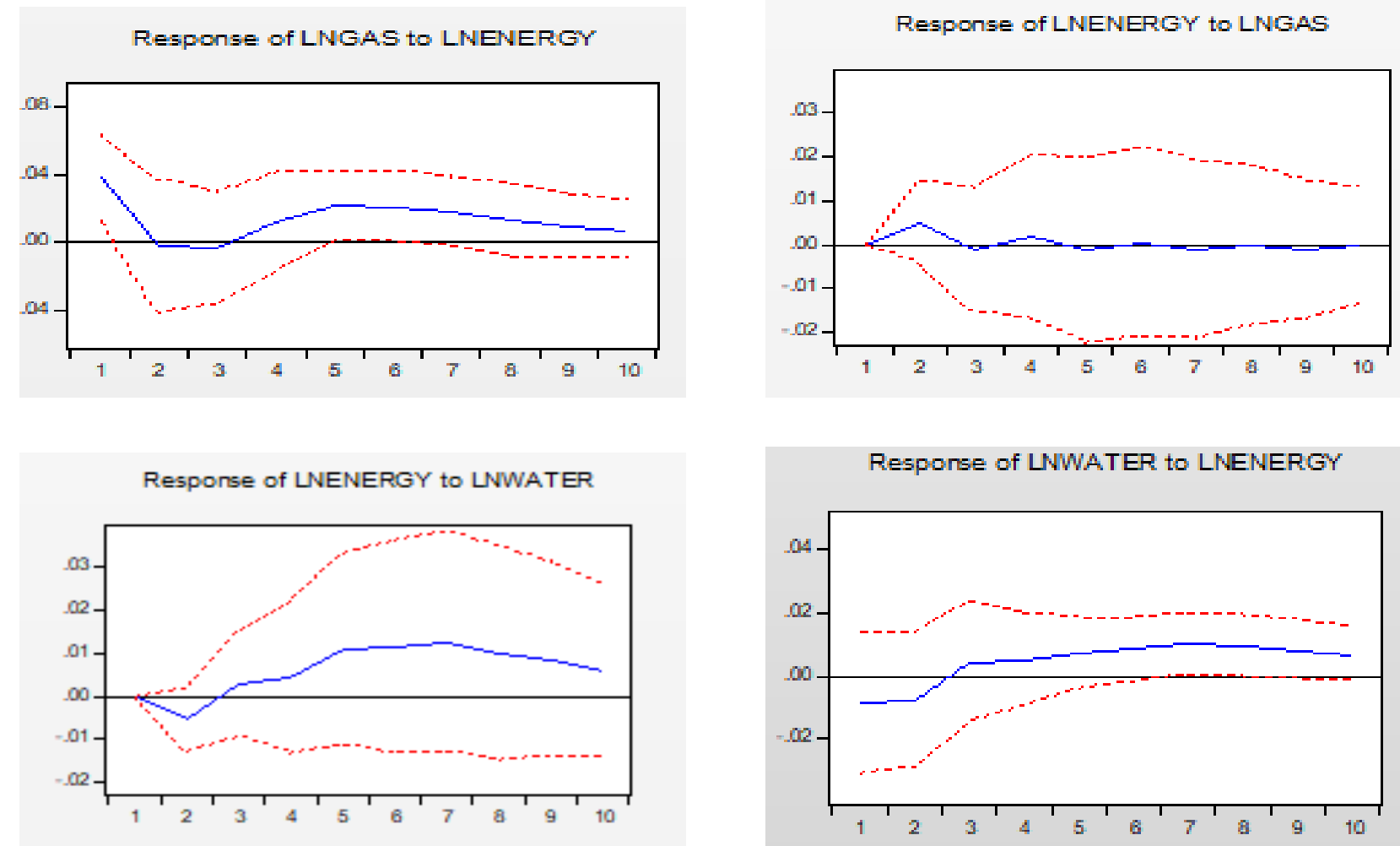


Results

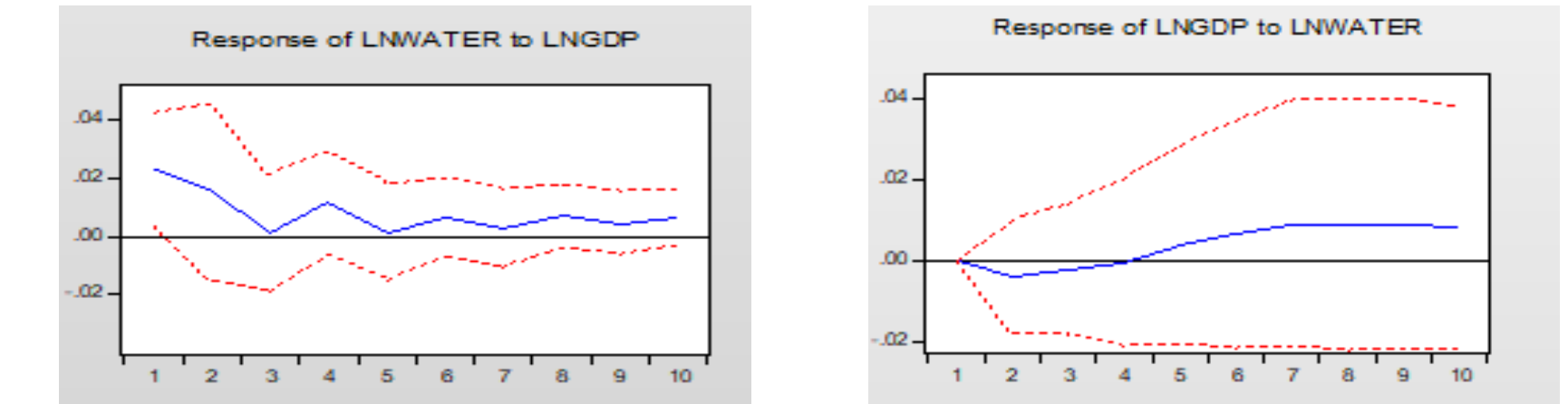
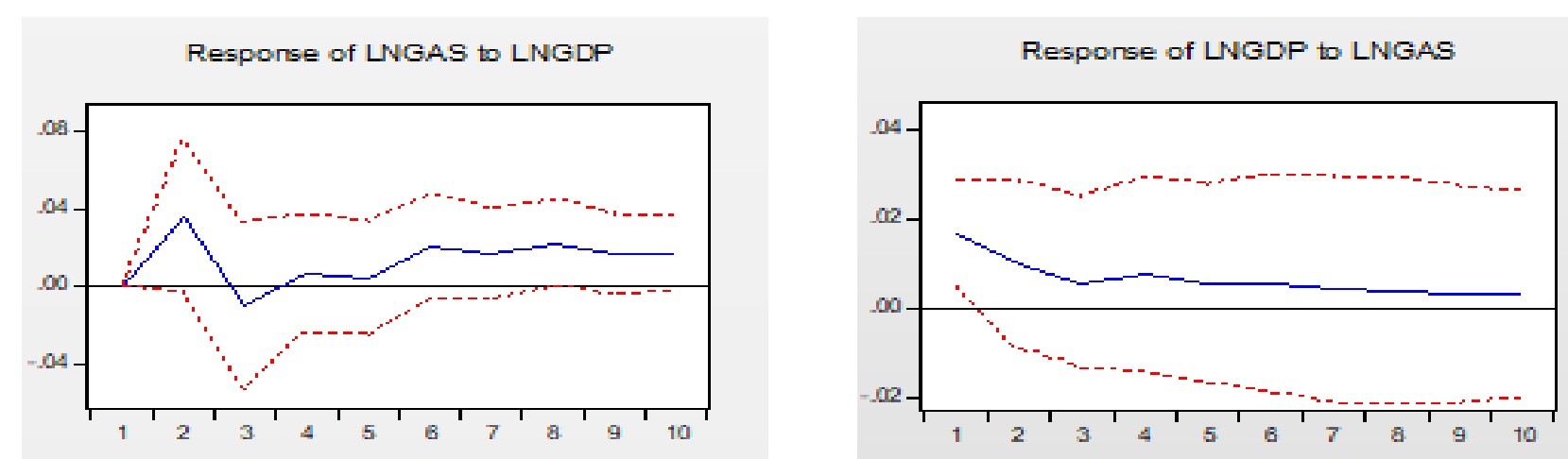
1. Energy consumption and economic development have a two-way relationship.
2. There is a one-way relationship between environmental pollution and energy consumption, that is, energy consumption has a direct impact on environmental pollution, but the severity of environmental pollution does not reflect energy consumption.
3. There is no direct relationship between economic development and environmental pollution



The above two figures illustrate that the continuous growth of energy consumption in Guangdong Province will promote the economic development of Guangdong Province, and the sustained economic development will increase energy consumption.



The rapid growth of energy consumption in Guangdong Province will lead to a continuous increase in industrial waste gas and wastewater discharge. However, the discharge of industrial waste gas and wastewater has nothing to do with energy consumption.



There is no direct impact on economic growth and environmental pollution (emission of wastewater and waste gas) in Guangdong Province.

Disadvantage

1. The energy utilization efficiency of Guangdong Province is low.
2. The economic growth mode of Guangdong Province relies heavily on energy and industrial development.
3. Environmental protection is not in place, the discharged wastewater, waste gas and waste cannot be effectively controlled.

Conclusion & Recommendations

Guangdong Province has a unified energy production and consumption framework. The total energy consumption exceeds the total energy production, and the gap between supply and demand is obvious. Energy use has improved, but the economy remains overly dependent on energy use. The current economic situation shows that the economic aggregate of Guangdong Province is growing rapidly, but the economic development is unbalanced. Judging from the status quo of the ecological environment, with the strengthening of environmental governance, the ecological environment has generally improved, but there are still many problems.

In this paper, an empirical study on the interaction mechanism between energy consumption, environmental pollution, and economic development in Guangdong Province from 2000 to 2020 shows that energy consumption and economic development have mutual influence, while energy consumption and environmental pollution have a one-way relationship. There is no clear relationship between economic expansion and pollution.

In view of the problems faced by Guangdong Province in the coordination of energy, economy and environment, the suggestions for improvement are as follows:

1. Actively promote the adjustment of economic structure.
2. Improve the energy management system.
3. Improve the level of energy technology.
4. Optimize the energy structure. The above measures will help Guangdong Province achieve sustainable economic development, reduce energy consumption, protect the environment and maintain the natural ecology..