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The Relationship Between Environment and Economy

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Abstract: In the recent decades, China has achieved significant economic growth, accompanied by environmental challenges, such as pollution and resource scarcity. These issues have raised concerns about the sustainability of its development model and impact on society. This paper mainly studies the impact of environmental change on national economy and society, and discusses whether the environmental change will affect the economic development and the national policies to mitigate the impact by consulting data and giving examples. The purpose of this research is to find out the factors that affect economic development and whether environmental changes affect economic development, and to give examples of China's solutions to environmental pollution. At the end of this paper, it will be explained that the pollution and destruction of the environment will not only affect the economic development, ecological balance, and have a negative impact on society, but also affect the health and survival of human beings.

Keywords: Environment, Economy, Pollution, Development

1. Introduction

Since the reform and opening up, China has experienced profound changes in its economic landscape. And its GDP has consistently grown, improving people's living standards and optimizing the economic structure. These developments underscore the rapid acceleration of China's economic growth rate, highlighting its formidable economic strength[1]. However, the broad expansion mode leads to significant resource consumption, resulting in elevated levels of pollution emissions. At present, China encounters numerous challenges in land utilization, air pollution, water preservation, and ecological safeguarding due to its substantial population and limited natural resources per person[2]. To address these challenges, China should implement the strategy of low resource consumption, and consumers need to consume reasonably, so that the economy will continue to grow steadily. Therefore, embracing sustainable development is the only viable path forward. This article will use existing literature to demonstrate the impact of environmental pollution on China's economy and society, as well as its strategies for mitigating these effects. And it specifically will discuss: (1) the impact of environmental pollution on the economy; (2) the impact of environmental pollution on the national level; and (3) China's approaches to addressing the environmental pollution.

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2. The analysis of the relationship between environment and economy in China

2.1. The economic impact of environmental pollution

An Environmental Kuznets Inverted U-shaped Curve (EKC) exists in the relationship between economic expansion and environmental pollution, as well as urbanization and environmental pollution[3]. The Environmental Kuznets inverted U-shaped curve suggests that in the initial stage of economic development, the environmental pollution level tends to rise as the rate of economic growth increases. However, once the national economy reaches a certain threshold, environmental pollution levels start to decrease as economic growth continues to grow, showing an inverted U-shaped curve. This curve was developed by the economist Simon Kuznets. According to the EKC theory, with the development of the national economy, people's awareness of environmental protection will gradually increase. At the same time, the government will also strengthen the management and supervision of the environmental protection. And environmental behavior will also improve, which will lead to a gradual reduction in environmental pollution. However, the EKC theory remains controversial. Some scholars believe that the theory is not universally applicable, and its relevance varies among countries. China, for example, as a developing country, faces challeges due to ongoing industrialization and infrastructure development, which can lead to increased pollution. And some of the pollution is irreversible. The empirical research reveals that economic growth are the discharge of industrial wastewater, industrial waste gas, and industrial dust may significantly contribute the pollution levels. Furthermore, the interaction between industrial waste gas discharge and industrial wastewater discharge can hinder economic growth.

2.2. The impact of environmental pollution on China

Many individuals in China, including its leaders, are aware of the growing environmental pollution and are making efforts to addressing them. While there have been improvements in the environmental conditions and air quality in several major urban areas, these endeavors have not equaled the magnitude of environmental harm or halted the ongoing decline in other metrics. And the environmental pollution issues encompass various concerns such as air pollution, biodiversity loss, farmland depletion, fisheries depletion, desertification, wetland loss, grassland degradation, escalating man-made natural disasters, invasive species, overgrazing, river disruption, salinization, soil erosion, garbage accumulation, water pollution, and water shortages. The aforementioned issues are resulting in significant economic ramifications, societal discord, and medical expenses in China.

An example is the construction of the Three Gorges Dam, a monumental undertaking that has had significant social, economic, and environmental impacts. The transformation of nature, however, presents a double-edged sword. Since its inception in 1994, it has, to a certain extent, sparkled social conflicts and disputes over compensation and resettlement. In the process of dam construction, a lot of earth excavation and blasting were needed, causing some damage to the soil environment. The earthmoving traffic has also resulted in noise and air particle pollution. In addition, excavation also required a large amount of water consumption, and excessive use of groundwater could lead to a decline in the groundwater level, disrupting the balance of the wetland ecosystem. Following the completion of the Three Gorges Dam, the changes in the reservoir level have affected the original hydrological ecosystem [4]. As the vegetation around the reservoir and the earth's natural terrain were submerged, a large amount of water flow led to local changes in the water environment [4]. At the same time, due to the blockage of reservoirs and changes in water flow, it was difficult for fish in some rivers to survive. In terms of the impact of its construction process on the natural environment, the project has caused some ecological damage, loss of arable land and increased risk of landslides. This has also resulted in negative impacts on the local economy and long-term medical costs due to

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population displacement and resettlement. These are adverse effects on the transformation of the natural environment.

The environmental issues in China have indeed become increasingly globalized, influenced by factors such as globalization, pollution, and resource exploitation from other nations. Though China's per capita environmental impact is significantly smaller than that of wealthy nations (as seen in Figure 1[5]), if China were to reach the same per capita environmental impact as developed countries, the overall impact on global humanity would be substantial. Therefore, it is crucial for China to establish a new system that aligns its current economic development stage, harmonizing economic and environmental developmentand promoting a sustainable development strategy.

Table 1 | Population, economy and environmental conditions of China and 14 other major countries*

Country	Population total (millions, 2003)	Annual population growth rate (%, 2003)	Ratio of growth in household numbers to population growth (1985–2000)	Average annual GDP growth (%, 1999–2003)	Ranking of environmental sustainability index (1–142)** 2002	CO_2 emission (metric tons per capita, 2000)	Total CO_2 emission (million metric tons, 2000)	Per capita ecological footprint (global ha per person, 2001)	SO_2 per populated area (1,000 metric tons per km^2, 2000)
China	1,288	0.7	2.7	8.0	129	2.2	2,780	1.5	2.7
Bangladesh	138	1.7	1.5	5.2	86	0.2	30	0.6	0.7
Brazil	177	1.2	1.9	1.6	20	1.8	310	2.2	0.4
India	1,064	1.5	1.2	5.8	116	1.1	1,120	0.8	1.2
Indonesia	214	1.3	1.8	2.0	100	1.3	270	1.2	0.4
Japan	127	0	6.1	1.3	78	9.3	1,180	4.3	1.0
Malaysia	25	1.9	1.3	4.9	68	6.2	140	3.0	1.6
Mexico	102	1.4	1.9	2.4	92	4.3	420	2.5	1.0
Nigeria	136	2.1	2.7	4.1	133	0.3	40	1.2	0.2
Pakistan	148	2.4	0.4	3.4	112	0.8	110	0.7	0.3
Philippines	82	1.9	1.4	4.3	117	1.0	80	1.2	0.9
Russia	143	−0.4	No data	6.7	72	9.9	1,440	4.4	0.9
Thailand	62	0.6	2.6	4.7	54	3.3	200	1.6	1.1
United States	291	0.9	1.6	3.2	45	19.8	5,590	9.5	1.7
Vietnam	81	1.1	1.5	6.5	94	0.7	55	0.8	0.3
World	6,271	1.2	1.6	2.5	—	4.0	24,210	2.2	1.7

*The most populous countries in the world, with at least 100 million people each, plus the four next most populous countries (Malaysia, Philippines, Thailand and Vietnam) in Southeast Asia.
**1 = most sustainable, 142 = least sustainable, among 142 countries ranked.

Figure 1: Population, economy and environment conditions of China and 14 other major countries[5]

At present, from some Western perspectives, it appears that China is a significant emitter of sulphur oxides and chlorofluorocarbons released into the atmosphere[6], with its emissions impacting on not only its own environment but also neighboring countries and even regions as far as North America. Furthermore, according to Adams and Castano [7], China is one of the top two importers of tropical rainforest timber, thus playing a significant role in driving tropical deforestation. And China's share of the global fish catch is 15%, while its intake of fish and seafood makes up 33% of the global total.

2.3. How dose China deal with the impact of environmental pollution

China is confronted with the simultaneous objectives of advancing the domestic economy and safeguarding the ecological environment. China's environmental protection and sustainable development policies have experienced five alterations since the 1980s: (1) Transitioning from regarding environmental protection as a fundamental national policy to adopting a sustainable development strategy; (2) Shifting the emphasis from pollution control to the preservation of ecological systems; (3) Moving away from comprehensive governance to targeted management of specific pollution sources; (4) Transitioning from managing pollution at specific points to adopting a regional approach to environmental governance; (5) Shifting the focus from relying solely on administrative measures to incorporating legal and economic mechanisms. China has prioritized sustainable development as a fundamental national goal since 1992. Nevertheless, China continues

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to face significant environmental pollution and ecological degradation, posing a substantial risk to both its economy and the overall quality of life. China's environmental protection and sustainable development policies hold immense importance, not only for China itself but also for the global community, given its status as the largest developing nation. Over the past two decades, China's GDP has experienced an impressive yearly growth rate of 9.7%. However, this expansion has been achieved through an extensive manner that heavily depletes resources and results in significant pollution emissions. China, two months after the Rio Conference, published the "Ten Strategic Guidelines for Environment and Development" and declared the National Sustainable Development Strategy, making it the initial developing nation to proclaim the execution of a sustainable development strategy. In 1994, China released "China Agenda 21", the world's first national-level Agenda 21 publication. China initiated a strategy in 1995 to carry out "two fundamental transformations" which involved shifting from a planned economic system to a socialist market economic system and achieving substantial economic growth. Since 1997, the Central Committee of the Communist Party of China has organized an annual symposium in March for eight consecutive years. The directors of the central and local provincial and municipal ministries convene to deliberate on matters pertaining to population, resources, and the environment. Organizing such symposiums has now become a routine practice. Since 2003, China's per capita GDP has surpassed US$1,000, marking the initiation of a new phase of upgrading in the social consumption structure and industrial development.

Today, the Chinese government has taken many measures to protect the environment. The first is to strengthen environmental monitoring and evaluation, identify environmental problems and pollution sources in a timely manner, and evaluate new projects and major renovation projects to ensure that project construction will not have a serious impact on the environment. The second is to promote cleaner production and circular economy, reduce pollutant emissions and resource consumption, and promote resource recycling. The third is to strengthen supervision of environmental law enforcement, severely crack down on environmental violations, and punish environmental crimes according to law. The fourth is to build ecological civilization, encourage ecological protection and restoration, and promote the coordinated development of the ecological environment and the economy and society.

3. Discussion

Environmental pollution and destruction will directly affect human health and survival. At the same time, environmental damage will also affect the ecological balance, resulting in the reduction of biodiversity and the collapse of ecosystems. Secondly, environmental pollution and damage will also have negative impacts on the economy and society. For example, pollution and damage will affect the development of tourism, agriculture, fishery and other industries, resulting in economic losses. In addition, environmental damage can lead to resource shortages and social instability. Therefore, protecting the environment is a necessary condition for safeguarding human health, promoting economic development and maintaining social stability. This paper should actively take measures to reduce pollution and damage, and promote the restoration and protection of the environment.

4. Conclusion

To some extent, this paper is instrumental in identifying policy prospects for promoting China's current and future sustainable development by effectively reconciling economic growth and environmental concerns. It successfully addresses three key problems regarding the impact of environmental pollution on the economy, while acknowledging the need for further data and research to enhance its findings.

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Firstly, it explores the adverse effects of environmental pollution on the economy. It examines how pollution, such as air and water pollution, can negatively affect various sectors, including manufacturing, agriculture, and tourism. By analyzing case studies and existing research, this paper demonstrates the significance of understanding and mitigating the economic consequences of environmental degradation. Secondly, it assesses the impact of environmental pollution at the national level. The research delves into the broader implications of pollution on macroeconomic indicators such as GDP growth, foreign direct investment, and public health expenditures. Analyzing this at the national level provides policymakers with a more comprehensive understanding of the long-term consequences of environmental pollution and the urgency for sustainable development. Thirdly, the paper evaluates China's approaches in addressing environmental pollution. It examines the existing policies, initiatives, and regulatory frameworks aimed at mitigating pollution and promoting sustainable development. By critically assessing the strengths and weaknesses of these approaches, the paper offers valuable insights for policymakers and stakeholders in China. However, it is acknowledged that some specific data may be lacking in this paper. Future research could be conducted to fill these gaps and provide a more comprehensive understanding of the economic impacts of environmental pollution. Data such as pollution levels in different regions, economic losses due to pollution-related illnesses, and the effectiveness of current policy interventions can be further explored.

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