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Economics of Sustainable Development——Harmonisation of Resources and the Environment

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Abstract: This paper explores the economic theory of sustainable development and its application to the coordination of resources and the environment. It first describes the evolution of the concept of sustainable development and the main theoretical models, and analyses the relationship between resource scarcity and economic development, environmental issues and economic analysis. This is followed by a discussion of the implementation strategies of resource management policies and environmental protection policies, as well as the experiences and challenges of developed and developing countries in sustainable development. In particular, the current situation in China is analysed, and policy recommendations and future perspectives for promoting sustainable development in China are presented. Through comprehensive analyses, the paper aims to provide theoretical support and policy recommendations for promoting the coordinated development of economic growth and environmental protection.

Keywords: sustainable development, resource management, environmental protection, economic growth.

1. Introduction

Sustainable development, as an important topic in contemporary economics and policy research, has gradually become a global consensus. With rapid economic development, the problems of resource depletion and environmental pollution have become increasingly serious, and human society is facing unprecedented challenges. How to ensure economic growth while achieving effective use of resources and environmental protection has become an urgent issue. The concept of sustainable development advocates meeting the needs of the present without threatening the ability of future generations to meet their needs. This concept requires us to re-examine the traditional economic growth model, and to consider it comprehensively from a number of dimensions, including resource utilisation efficiency, environmental protection and social equity[1]. Against this background, this report aims to explore the theoretical foundations of sustainable development economics, economic analyses of resources and the environment, and corresponding policy recommendations. By drawing on international experience and case analyses, especially the in-depth study of China's sustainable development path, we hope to provide useful references and insights for future economic development and policy formulation.

2. Theoretical foundations of sustainable development

2.1. Evolution of the concept of sustainable development

The concept of sustainable development has evolved over time, from the initial simple use of resources to today's multidimensional and comprehensive considerations. 1960s, environmental protectionism began to rise, initially put forward the finite nature of resources and the importance of ecological protection. 1972, the United Nations Conference on the Human Environment was held in Stockholm, put forward the concept of "protecting and improving the environment for the benefit of future generations". In 1972, the United Nations Conference on the Human Environment was held in Stockholm, which put forward the concept of "protecting and improving the environment for the benefit of future generations", marking the budding of the global awareness of sustainable

development. 1987, the United Nations World Commission on Environment and Development issued the report "Our Common Future", which explicitly proposed the definition of sustainable development, which is to "satisfy the needs of the present without compromising the ability of future generations to satisfy their own needs". In 1987, the United Nations World Commission on Environment and Development issued the report "Our Common Future", which explicitly proposed the definition of sustainable development as "meeting the needs of the present without compromising the ability of future generations to meet their own needs", a definition that has served as the basis for subsequent international policy and academic research.

Entering the 21st century, the United Nations launched the Millennium Development Goals (MDGs) in 2000, which further promoted the practice of sustainable development on a global scale[2].In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, which puts forward 17 Sustainable Development Goals (SDGs) covering a wide range of topics, from eradicating poverty and protecting the planet to promoting prosperity. These goals emphasise the coordinated development of the three pillars of economy, society and environment, marking a comprehensive deepening and concretisation of the concept of sustainable development. Through these evolutions, sustainable development has been gradually transformed from theory into practice, providing a clear direction and framework for policymaking around the globe.

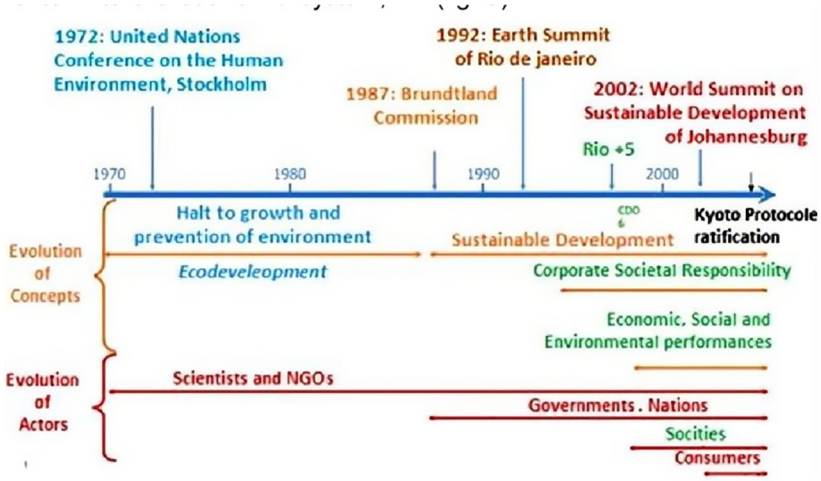

Figure 1 Evolution of the concept of sustainable development

2.2. Main theoretical models

Theoretical models of sustainable development play an important guiding role in academia and practice. These models help to explain and predict the complex relationship between resources and the environment and provide a scientific basis for policy formulation.

The Environmental Kuznets Curve (EKC), a model that assumes that environmental pollution increases in the early stages of economic growth but decreases as the economy continues to grow after a certain level of income is reached.The EKC model reveals a non-linear relationship between economic development and environmental quality, but it has also led to a discussion of developing countries and the issue of global environmental equity.

The Triple Bottom Line (TBL) model, proposed by John Elkington, advocates that businesses and policies should not only focus on economic efficiency, but also balance environmental protection and social responsibility. This model emphasises the harmonious development of economic, environmental and social aspects and is widely used in CSR and sustainability assessment[3].

Natural capital theory, which views natural resources as important capital, alongside human and physical capital. The natural capital theory emphasises that economic activities should maintain the stock and quality of natural capital to avoid resource depletion and ecosystem degradation, thereby achieving long-term sustainable development.

Steady-state economic theory, proposed by Herman Daly, advocates that economic growth should take place within the carrying capacity of the Earth's ecosystem. Steady-state economic theory opposes unlimited economic growth and advocates the harmonious coexistence of the economy and the environment through technological progress and improved resource efficiency.

3. Economic analysis of resources and the environment

3.1 Resource scarcity and economic development

Resource scarcity is one of the core issues of economics and has far-reaching implications for economic development. As the global population grows and economic activity expands, natural resources are being consumed at an accelerating rate, and many key resources are at risk of depletion. Resource scarcity not only limits productive capacity and economic growth, but can also trigger competition for resources and social conflict. Effective management and use of finite resources have therefore become key to achieving sustainable development.

Resource scarcity has prompted people to improve the efficiency of resource use and to promote technological innovation. For example, economic growth can be sustained while reducing resource consumption through the development and adoption of energy-efficient technologies and increased rates of resource recycling. In addition, resource scarcity drives the development of alternative resources, such as renewable energy to replace fossil fuels, thereby reducing dependence on finite resources. Resource scarcity highlights the problem of externalities of economic activity. The overexploitation and overuse of many resources leads to environmental degradation and ecological damage, with significant social costs. To address this problem, it is necessary to internalise externalities and promote the sustainable use of resources through policy instruments such as resource taxes, environmental regulations and market mechanisms. Resource scarcity has also triggered a rethinking of the economic growth model. The traditional model of economic growth, which relies on large resource inputs and high pollution emissions, is no longer sustainable. Promoting a green and circular economy and advocating low-carbon, environmentally friendly and efficient modes of economic activity has become an important path to achieving coordinated development of resources and the economy.

3.2 Environmental issues and economic analyses

The relationship between environmental issues and economic development is complex and close, and is one of the core topics in sustainable development research. Environmental problems mainly include air pollution, water resource pollution, soil degradation, biodiversity reduction and climate change, which not only affect human health and the stability of ecosystems, but also constrain long-term sustainable economic development.

Externalities arising from environmental problems are key to economic analysis. Pollution and ecological damage are usually not reflected in market transactions, leading to inefficient resource allocation and loss of social welfare. In order to correct such market failures, economists have proposed a variety of policy tools to internalise externalities, such as pollution taxes, emissions trading systems and environmental regulations, to guide firms and individuals to reduce pollution emissions and resource wastage through market mechanisms and policy interventions. The mutual feedback relationship between environmental issues and economic activities also deserves attention. Expansion of economic activities is often accompanied by resource depletion and environmental pollution, while environmental degradation in turn limits economic development. For example, air pollution not only reduces the health and productivity of the labour force, but also increases medical expenditures and public health risks, thus negatively affecting the economy. The trade-off between environmental protection and economic development is also an important topic for economic analysis. In the short term, stringent environmental protection measures may increase business costs and affect economic growth. However, in the long run, environmental protection investments and green technology innovations can improve resource utilisation efficiency, reduce environmental

management costs and promote sustainable economic development. Therefore, a balance needs to be found between environmental protection and economic development to ensure that they are promoted in a coordinated manner. The global and cross-regional nature of environmental issues requires international cooperation and coordination. Global environmental problems, such as climate change, need to be addressed jointly by all countries, through international agreements and cooperation mechanisms, such as the Paris Agreement, to promote environmental protection and sustainable development on a global scale.

4. Economic policies for sustainable development

4.1 Resource management policy

Resource management policies play a key role in promoting sustainable development, aiming to ensure the coordination of economic development and ecological protection through the rational allocation and efficient use of natural resources. Effective resource management policies not only alleviate the pressure of resource scarcity, but also promote environmental protection and social well-being.

Resource management policies should be geared towards improving the efficiency of resource use. Governments and enterprises can achieve efficient use and recycling of resources through technological innovation and management optimisation. For example, the promotion of water-saving irrigation techniques, energy efficiency enhancement and waste recycling measures can not only save resources, but also reduce environmental pollution and economic costs. Resource management policies need to develop a scientific resource pricing mechanism. Resource prices should reflect their true economic value and environmental costs in order to avoid over-exploitation and waste of resources. The implementation of economic instruments such as resource taxes and royalties can effectively regulate resource consumption behaviour and guide market players to choose more sustainable production and consumption methods[4]. Establish and improve resource protection regulations and systems. The government should formulate strict resource protection laws and regulations, specify standards and restrictions on resource development and utilisation, and strengthen supervision and law enforcement. For example, key ecosystems and biodiversity should be protected through the establishment of nature reserves, restrictions on over-exploitation and the implementation of measures such as ecological compensation.

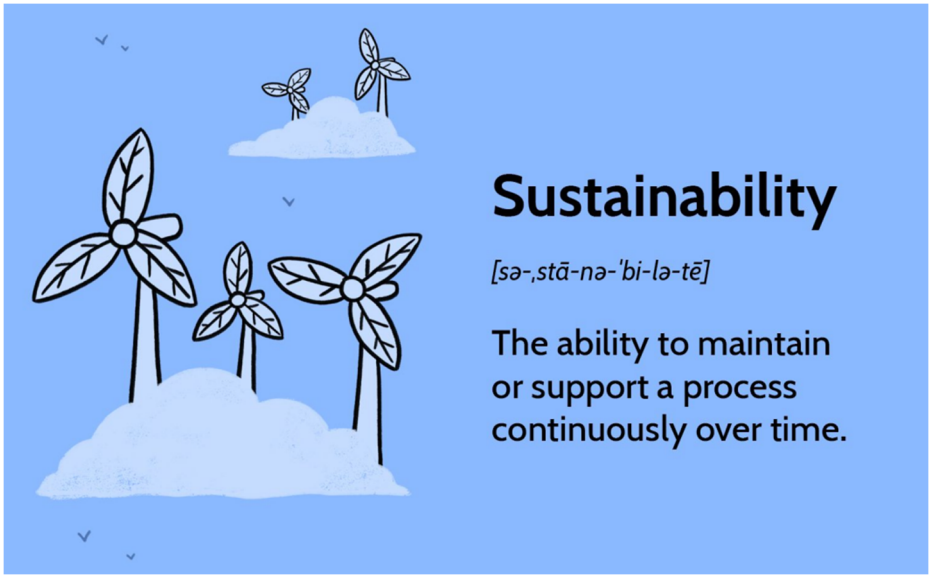

Figure 2 Resource management policy

4.2 Environmental protection policies

Environmental protection policies are an important means of achieving sustainable development, aimed at controlling pollution, protecting ecosystems and promoting the harmonious development of the economy and the environment through a series of institutions and measures. These policies cover a wide range of areas, from regulatory development to economic incentives.

The core of environmental protection policy is the establishment of sound environmental regulations and standards. The Government should formulate strict environmental protection laws and regulations, set standards for pollutant emissions and environmental quality standards, and ensure that the production and living behaviour of enterprises and individuals meets the requirements of the regulations. For example, measures such as controlling industrial emissions, limiting water pollutant discharges and regulating waste disposal can help reduce environmental pollution and protect the ecological environment. Implement economic incentive policies to guide green development. Through economic instruments such as pollution taxes, emissions trading systems and green subsidies, enterprises are incentivised to adopt cleaner production technologies and environmental protection measures to promote resource conservation and environmental protection. For example, the emissions trading system allows enterprises to buy and sell emission allowances through the market mechanism, encouraging emissions reduction and innovation. Strengthen environmental monitoring and law enforcement. Establish a comprehensive environmental monitoring network to monitor environmental quality and pollution emissions in real time, so as to detect and deal with environmental problems in a timely manner. Strengthen environmental law enforcement, strictly investigate and deal with environmental offences, and ensure that environmental regulations and standards are effectively enforced.

5. International experience and case studies

5.1 Sustainable development experiences of developed countries

Developed countries have accumulated rich experience in sustainable development and have provided many successful cases worthy of reference.

A sound legal and policy framework is key. Developed countries usually have strict environmental protection laws and regulations, and promote active participation of enterprises and the public in environmental protection actions through policy guidance and economic incentives. For example, the European Union (EU) has set clear emission reduction targets and renewable energy development programmes through its Climate and Energy Framework, while the United States strictly controls pollutant emissions through the Clean Air Act and the Clean Water Act. Emphasis on scientific and technological innovation and green technology development. Developed countries have invested heavily in environmental science and technology research and development and the promotion of green technology to improve resource utilisation efficiency and environmental protection. For example, Germany's energy transition policy strongly supports the development of renewable energy, making it a global leader in the use of renewable energy, while Japan realises waste resourcing and efficient resource utilisation through its circular economy model. Implementation of effective resource management and environmental protection measures. Developed countries focus on the integrated management of resource management and environmental protection, and adopt various means to protect natural resources and the ecological environment. For example, Sweden has achieved efficient resource recycling through a strict waste separation and recycling system, while Canada has protected biodiversity and ecosystems through the establishment of national parks and nature reserves. Public participation and environmental education are important supports. Developed countries generally attach importance to environmental education, raise public awareness of environmental protection and encourage public participation in environmental protection actions. For example, Finland fosters public environmental protection concepts and behavioural habits through school education and social publicity, while the United States strengthens the sense of responsibility

and action of all sectors of society for environmental protection through community environmental protection projects and public participation mechanisms.

5.2 Sustainable development challenges in developing countries

Developing countries face a number of challenges in achieving sustainable development, mainly in the economic, social and environmental spheres.

The contradiction between economic development and environmental protection is prominent. Developing countries are often at a stage of rapid industrialisation and urbanisation, and economic growth is marked by high demand for resources and high pressure on the environment. On the one hand, these countries need to raise the living standards of their people through economic development; on the other hand, the problems of over-exploitation of resources and environmental pollution are becoming increasingly serious, constraining sustainable development. For example, air pollution, water pollution and land degradation are widespread in many developing countries, leading to ecosystem degradation and public health problems. The implementation of resource management and environmental protection policies is inadequate. Many developing countries lack sound environmental laws and regulations and effective policy implementation mechanisms, and face many difficulties in resource management and environmental protection. Lax law enforcement, weak regulation and weak public awareness of environmental protection make it difficult to implement environmental protection policies, and waste of resources and environmental damage are common. The lack of technology and financial resources constrains the process of sustainable development. Developing countries suffer from an obvious shortage of funds and technology in the development and application of environmental protection technology, which limits the implementation and effectiveness of environmental protection measures. The lack of advanced environmental technology and adequate financial support makes it difficult to effectively address many environmental problems.

6. China's path to sustainable development

6.1 Analysis of the current situation

China has made remarkable progress on the path to sustainable development, but also faces a number of challenges and problems. Rapid economic growth has brought about remarkable development achievements, but it has also been accompanied by increased resource consumption and environmental pressures. China was the world's largest consumer of energy and emitter of carbon dioxide, and its energy structure still relied on coal, leading to serious air pollution and carbon emission problems.

In terms of resource management, China faces the challenges of inefficient resource use and excessive resource consumption. Although the Chinese Government has introduced a series of policy measures, such as resource tax reforms and energy-saving and emission reduction targets, there are still many challenges at the implementation and regulatory levels, such as local protectionism and weak environmental law enforcement, which affect the effectiveness of policies. In addition, the problems of environmental pollution and ecological damage have become increasingly serious. Problems such as water pollution, soil contamination and loss of biodiversity have affected the health of ecosystems and people's quality of life. Despite the Chinese Government's efforts to promote ecological civilization and environmental governance, it still faces challenges in local implementation and industrial transformation.

However, China had also actively explored and practised sustainable development paths. Through measures such as strengthening environmental monitoring, promoting clean energy and implementing ecological compensation, China had endeavoured to improve environmental quality and promote the economical use of resources. At the same time, China was actively participating in international environmental cooperation, strengthening international exchanges and experience-sharing, and promoting the process of global environmental governance.

6.2 Policy recommendations

In order to strengthen China's sustainable development, a series of policy measures are needed that integrate the balance between economic growth, resource management and environmental protection.

Strengthening resource conservation and recycling. Stricter resource management policies have been formulated and implemented, including measures to promote cleaner production technologies, establish a resource tax system and strengthen waste treatment and recycling. Promote the transformation of the economy into a resource-saving and environmentally friendly one by improving the efficiency of resource utilisation and reducing resource consumption and environmental load. Promote the transformation of the energy structure. Accelerate the development of clean energy, especially the use of renewable energy sources such as wind, solar and nuclear energy, and reduce reliance on traditional energy sources such as coal. Establish a sound energy policy system, including energy efficiency improvement, carbon market construction and energy technology innovation, to achieve sustainable development in energy production and consumption. Strengthen environmental protection and ecological restoration. Strengthen environmental monitoring and law enforcement, and strictly control pollutant emissions, especially air and water pollution. Promote the red line of ecological protection and the ecological compensation mechanism, promote ecosystem restoration and biodiversity protection, and enhance environmental quality and people's quality of life. Strengthen public participation and environmental education. Through environmental protection publicity and education activities, raise public awareness of and participation in environmental issues, and cultivate environmental awareness and action. A sound social participation mechanism will be established to enhance public understanding of and support for environmental policies, form a social consensus and promote the achievement of sustainable development goals.

7. Future prospects

In the future, China will face new opportunities and challenges on the road to sustainable development. With the increasing prominence of global environmental issues and the need for domestic economic transformation and upgrading, China will further strengthen its sustainable development policies and practices.

China is expected to accelerate its green and low-carbon development. With technological advances and policy support, clean energy will be more widely used in the energy mix to reduce dependence on fossil fuels. Meanwhile, through the construction of the carbon market and trading of carbon emission rights, enterprises will be promoted to reduce emissions and control carbon emissions, and the economy will be pushed to shift towards carbon neutrality. China will further strengthen the construction of ecological civilisation. It will strengthen the red line of ecological protection and the ecological compensation mechanism, protect ecosystems and biodiversity, and promote the sustainable use of natural resources. It will promote the green development of agriculture, urban ecological construction and ecological restoration projects, and improve environmental quality and the living environment. In the future, China will also focus on national participation and scientific and technological innovation. By strengthening environmental education and publicity, it will raise public awareness of environmental protection and promote the participation of the whole society in environmental protection actions. At the same time, it will vigorously promote scientific and technological innovation, research and develop environmental protection technologies and solutions, and improve the efficiency of resource utilisation and environmental governance. China will continue to strengthen international cooperation and actively participate in the global environmental governance process. Through multilateral cooperation and international exchanges, it will share its experience and technologies to jointly address global environmental challenges and promote the implementation of the global sustainable development agenda.

8. Conclusion

Sustainable development is an important issue facing the world today and a strategic choice for China's long-term development. This paper analyses and discusses many aspects of sustainable development, such as economics, coordination of resources and environment, and concludes the following points:

First, the deepening of the concept of sustainable development and the continuous improvement of the policy framework are important guarantees for the promotion of sustainable development in China. China had established a system covering laws and regulations, policy measures and social participation, laying a solid foundation for achieving a win-win situation for both economic growth and environmental protection. Secondly, China has made remarkable progress in resource management and environmental protection, but still faces challenges. In the future, there is a need to further strengthen the conservation and utilisation of resources, promote energy transformation, and intensify environmental monitoring and law enforcement in order to cope with the increasingly serious environmental problems. Thirdly, the key to the future lies in the joint efforts of society as a whole and international cooperation. Only through the concerted efforts of the Government, enterprises and the public, as well as close cooperation with the international community, could we effectively address global environmental challenges and achieve the long-term goal of sustainable development. Lastly, China would continue to explore and innovate in promoting economic development, improving the ecological environment and upgrading the quality of life of its people, and would make unremitting efforts to build a modern country that was vibrant, harmonious and beautiful.

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