

# Study on the Impact of Green Finance on The Sustainability of Logistics Operations

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## Abstract

**With the increasing severity of global climate change and environmental pollution, promoting sustainable development has become a global consensus. Logistics operations, as an important component of modern economy, also face many sustainability issues. The rise of green finance provides a new way to improve the sustainability of logistics operations. This paper will elaborate the definition of green finance and its relationship with sustainable development, analyze the application of green finance in logistics operation sustainability, and discuss the importance of green finance to logistics operation sustainability.**

## Keywords

**Green finance; Logistics operations; Sustainability.**

## 1. Introduction

While the global economy is developing at a fast pace, environmental issues are gradually attracting attention. In order to cope with environmental problems and resource shortages, green finance has gradually become a hot topic in the international community[1]. Green finance is a financial approach to promote economic development with the goal of environmental protection, which aims to achieve a balance of economic, social and environmental interests by investing in sustainable economic activities.[2] In this context, green finance has become one of the key factors to promote sustainable development.

Logistics operations is an industry closely related to the environment, which involves the storage, transportation and delivery of goods[3]. Due to the high complexity and large-scale nature of logistics operation activities, its environmental impact is also quite significant. Against the background of increasingly serious environmental issues such as global warming and climate change, logistics companies play an important role in reducing their impact on the environment[4]. Therefore, promoting the sustainability of logistics operations by means of green finance has become an urgent issue to be addressed.

In the logistics industry, traditional financial models tend to focus on short-term benefits, ignoring long-term social and environmental responsibilities[5]. With the increase of environmental awareness and the call for sustainable development, green finance, as a new financial model, can help logistics enterprises better assume social and environmental responsibilities and promote the transformation of the logistics industry towards sustainable development[6]. At the same time, green finance can also provide logistics enterprises with more stable and low-cost financing channels, improve their financing capacity, and provide support for their sustainable development[7]. In addition, the sustainability impact of green finance on logistics operations includes a series of specific measures and methods, such as

green loans, green bonds, carbon neutral finance, etc. These measures and methods not only help reduce the environmental impact of logistics enterprises, but also provide them with new business opportunities and competitive advantages[8]. Therefore, the impact of green finance on the sustainability of logistics operations has important theoretical and practical significance and is worthy of further study and exploration.

## **2. Current Status of Research**

### **2.1. Research on green finance**

Green finance is an emerging financial concept in recent years, which refers to supporting and promoting economic and social activities related to environmental protection and sustainable development through the innovation of financial instruments and financial markets with the goal of environmental protection and sustainable development[9]. Green finance includes a variety of financial instruments such as green bonds, carbon finance, green insurance, green funds, green credit, etc. Through investment, financing, risk management and other means, it can achieve support for environmentally friendly enterprises, projects, industries, etc., and also achieve the sustainable development of the financial industry itself[10]. The emergence and development of green finance stems from the increasing attention to environmental issues and sustainable development worldwide, and its main purpose is to reduce or avoid environmental damage and resource waste, and to play an active role in environmental protection and sustainable development[11]. At the same time, the application of green finance also has an important economic value, which can create economic benefits and social value for enterprises and society.

In the promotion and development of global green finance, the international community has also made active exploration and attempts[12]. For example, the United Nations released the Sustainable Development Goals (SDGs) in 2015, which include goals such as "responsible consumption and production" and "climate action", providing global strategic guidance for the development of green finance[13]. In addition, several countries and regions have also launched relevant policies and measures to promote the application and development of green finance.

Overall, green finance, as an emerging financial concept, not only contributes to environmental protection and sustainable development, but also brings new development opportunities for the financial industry. With the increasing awareness of global environmental protection and sustainable development, the application and development prospect of green finance will also be increasingly broad.

### **2.2. Research on the sustainability of logistics operations**

Logistics operations are an integral part of modern society, involving the flow and management of goods, information, cargo and capital. However, as the global economy continues to develop and the scale of logistics operations grows, the environmental, social and economic issues arising from them are becoming increasingly prominent[14]. Therefore, how to ensure the sustainability of logistics operations has become an important issue.

**2.2.1 Environmental problems.** The environmental problems caused by logistics operation are mainly manifested in energy consumption, greenhouse gas emission, water consumption and other aspects[15]. Among them, energy consumption is one of the most prominent problems. According to statistics, the annual consumption of fuel in the global logistics industry accounts for 5%~7% of the total global energy consumption[16]. The burning of fuel not only emits a large amount of greenhouse gases such as carbon dioxide, sulfur dioxide and nitrogen oxides, but also produces environmental problems such as pollutants and noise.

2.2.2 Social issues. The social issues of logistics operations are mainly related to personnel and safety issues. In logistics operations, many employees are required to perform a large number of manual operations, which can have a certain impact on human health[17]. In addition, since logistics operations often need to be carried out in a complex transportation environment, safety is also an issue that cannot be ignored. For example, accidents in vehicles such as trucks and ships can cause loss of life and property to personnel.

2.2.3 Economic issues. The economic issues of logistics operations are mainly in terms of cost, efficiency and competitiveness. Logistics operation needs to consume a large amount of resources and capital, so cost is often an important issue. At the same time, the efficiency and competitiveness of logistics operation are also constrained by many factors, such as traffic congestion, logistics distribution efficiency and other issues[18].

In summary, the issue of sustainability of logistics operations involves not only environmental issues, but also social and economic issues. In order to solve these problems, a series of measures are needed. For example, we can reduce energy consumption and environmental pollution by promoting the use of clean energy, optimizing logistics routes and improving transportation facilities[19]. In addition, strengthening safety education and raising employees' safety awareness can effectively prevent safety accidents[20]. Finally, by introducing advanced logistics technology and management methods, the efficiency and competitiveness of logistics operations can be improved.

### **3. Impact of Green Finance on Logistics Operations**

#### **3.1. Application of green finance in the logistics industry**

The application of green finance in the logistics industry is gradually strengthening. The application of green finance can improve the awareness of social responsibility of logistics enterprises, improve the ecological environment of logistics industry and achieve sustainable development. The following is the application of green finance in the logistics industry:

3.1.1 Green bonds: Logistics companies can issue green bonds to raise funds to support green logistics projects, such as improving transportation facilities, enhancing energy efficiency, and optimizing transportation routes. These initiatives can reduce the environmental impact of logistics operations.

3.1.2 Green insurance: Logistics enterprises can reduce environmental risks and economic risks by purchasing green insurance. For example, the purchase of pollution liability insurance can protect logistics enterprises from the compensation costs required for pollution incidents that occur during the transportation process.

3.1.3 Green Fund: The Green Fund can provide financial support to logistics companies to support environmental protection and sustainable development projects. These projects include building green transportation facilities, purchasing low-emission vehicles, optimizing supply chains, etc.

3.1.4 Green Loans: Green loans are loans granted to support environmentally friendly enterprises and projects. Logistics enterprises can apply for green loans to support the implementation of green logistics projects.

3.1.5 Green Securities: Logistics companies can raise funds to support the implementation of green logistics projects by issuing green securities. These securities include green bonds, sustainable bonds, green stocks, etc.

In summary, the application of green finance in the logistics industry can promote the sustainable development of the logistics industry, reduce the impact on the environment and improve the social responsibility of logistics enterprises.

## 3.2. Impact of green finance on the sustainability of logistics operations

### 3.2.1 Improve the efficiency of capital utilization

Green finance can provide investment and financing for environmental projects, including improving logistics facilities and optimizing logistics transportation methods, thereby reducing the environmental and social costs of logistics operations. These environmental projects can improve the energy use efficiency and environmental benefits of logistics operations, thus improving the sustainability of logistics operations.

First, green finance can provide logistics enterprises with diversified financing channels. Green finance includes not only traditional bank loans and equity financing, but also green bonds, carbon credits and other forms of financing. These diversified financing channels can make logistics enterprises more flexible in choosing the financing methods that suit them and improve the efficiency of capital utilization. Secondly, green finance imposes stricter supervision and requirements on the use of funds by logistics enterprises. Under the promotion of green finance, logistics enterprises need to pay more attention to environmental protection and sustainable development issues and comply with relevant environmental protection and social responsibility requirements. This makes logistics enterprises need to manage the use of funds more carefully, so as to improve the efficiency of capital utilization. Third, green finance can improve the market competitiveness of logistics enterprises. With the gradual improvement of environmental protection awareness, more and more enterprises and consumers pay more attention to the application of green logistics, which provides a broad market space for logistics enterprises. And green finance, as an important supporter of green products, can win more market recognition for logistics enterprises, improve their market competitiveness, and thus further improve the efficiency of capital utilization.

To sum up, green finance has an important role in improving the efficiency of capital utilization of logistics enterprises. Its measures, such as providing diversified financing channels, strengthening supervision on the use of funds and improving market competitiveness, can help logistics enterprises use funds more effectively and improve their profitability and competitiveness.

### 3.2.2 Promote the development of green logistics technology

Green finance can provide financial support for the research, development and application of green logistics technology, such as energy-saving and emission reduction technology, logistics information technology, etc., so as to promote the development of logistics industry in a sustainable direction. First of all, green finance can provide financial support for the research, development and application of green logistics technology. Green logistics technology usually requires a large amount of investment, and green finance can provide financial support to the research, development and application of green logistics technology through various ways, so as to promote the development of green logistics technology. Secondly, green finance can improve the market competitiveness of green logistics technology. With the gradual improvement of environmental protection awareness, more and more enterprises and consumers pay more attention to the application of green logistics technology, which provides a broad market space for the development of green logistics technology. And green finance, as an important supporter of green products, can win more market recognition for green logistics technology and improve its market competitiveness. Third, green finance can promote the standardization and standardization of green logistics technology. Green finance usually has higher requirements for environmental and social information disclosure, which drives enterprises to pay more attention to environmental protection and sustainable development issues. Under the promotion of green finance, enterprises need to pay more attention to the standardization and standardization of green logistics technology, so as to promote the development of green logistics technology.

To sum up, green finance has an important role in promoting the development of green logistics technology. Its measures, such as the guidance and flow of funds, market recognition and standard requirements, can promote the development of green logistics technology and further promote environmental protection and sustainable development.

### 3.2.3 Promote the implementation of corporate social responsibility

Green finance requires financial institutions to incorporate environmental and social considerations in the financing process, thereby promoting the implementation of corporate social responsibility in logistics operations. Through the application of green finance, enterprises will give more consideration to environmental and social issues in logistics operations, improve their social responsibility awareness and image, and thus promote the realization of sustainable logistics operations. Green finance can not only promote the construction of green logistics supply chain, but also promote the implementation of corporate social responsibility. The following are the specific reasons:

First, green finance can provide financial support for enterprises, which enables them to better fulfill their social responsibilities. For example, companies can obtain funds through green finance to produce environmentally friendly products and improve employee welfare, thus realizing their social responsibility. Secondly, green finance requires companies to disclose more information on environmental, social and governance aspects, which motivates companies to pay more attention to the implementation of social responsibility. Enterprises need to consider their own social responsibility and sustainable development in the process of disclosing information, thus promoting them to better fulfill their social responsibility. Third, the promotion of green finance can win more social recognition for enterprises. As society pays more attention to environmental protection and sustainable development issues, more and more consumers and investors will pay more attention to corporate social responsibility issues. Green finance, as an important supporter of green products, can win more social recognition for enterprises and enhance their brand value and competitiveness.

To sum up, green finance has an important role in promoting the implementation of corporate social responsibility. Its measures such as guidance and flow of funds, disclosure of information and market recognition can promote enterprises to pay more attention to social responsibility and sustainable development issues, realize the implementation of CSR, and make positive contributions to the sustainable development of society and the environment.

### 3.2.4 Promote the construction of green supply chain

Green finance is a new financial model developed in response to global challenges, such as climate change and environmental pollution. It has an important role in promoting the construction of green logistics supply chain by directing and flowing funds to support and promote projects and industries for sustainable development and environmental protection.

First of all, green finance can provide various forms of financial support for green logistics supply chain, such as loans, equity investment and bonds. The guidance and flow of these funds can promote enterprises to adopt more environmentally friendly technologies and techniques in all aspects of production, transportation and sales, and promote the transformation and upgrading of enterprises to green logistics supply chains. Secondly, green finance requires more information disclosure from enterprises, requiring them to disclose environmental, social and governance information, which can prompt them to pay more attention to environmental protection and sustainable development issues. In addition, green finance also requires enterprises to disclose the construction of green logistics supply chains, which can help improve the transparency of green logistics supply chains and make consumers more aware of the production process of products, thus promoting more enterprises to join the construction of green logistics supply chains. Third, the promotion of green finance can win more recognition for enterprises in the market. With the gradual improvement of consumers' awareness of

environmental protection, more and more consumers are willing to choose green products, which forms a positive promotion for the construction of green logistics supply chain. And green finance, as an important supporter of green products, can win more market recognition for enterprises and enhance their brand value and competitiveness.

To sum up, green finance has an important role in promoting the construction of green logistics supply chain. Its measures such as guidance and flow of funds, disclosure of information, and market recognition can promote enterprises to pay more attention to environmental protection and sustainable development issues, achieve the construction goals of green logistics supply chain, and make positive contributions to environmental protection and sustainable development.

### **3.3. The impact of green finance on the environmental awareness of logistics enterprises**

The influence of green finance on logistics enterprises' environmental awareness is an important research direction. Green finance can encourage and support logistics enterprises to carry out environmental protection activities through various financial instruments, such as green loans, green bonds, carbon trading, etc., and then influence logistics enterprises' environmental awareness and behavior. The following are some discussions on the impact of green finance on the environmental awareness of logistics enterprises:

3.3.1 Green finance encourages logistics enterprises to achieve environmental protection goals. The emergence of green finance mechanisms can provide financial support for logistics enterprises, making it easier for them to carry out environmental protection activities, such as promoting low-carbon logistics and improving energy use efficiency. In this process, logistics enterprises can not only reduce environmental pollution, but also reduce operating costs and improve their corporate image, which in turn stimulates their environmental awareness and actions.

3.3.2 Green finance improves the environmental awareness of logistics enterprises. The establishment and implementation of green finance mechanism can make logistics enterprises more aware and understand the importance of environmental protection. In the process of financing, green financial institutions will also evaluate the environmental protection ability of logistics enterprises, so logistics enterprises also need to actively improve their own environmental protection ability and environmental protection awareness in order to obtain more green financial support.

3.3.3 Green finance guides logistics enterprises toward green and sustainable development. With the support of green finance, logistics enterprises can incorporate green concepts into their development strategies, adopt green operation methods, promote the use of renewable energy, etc. to achieve sustainable development. This development approach is conducive to logistics enterprises to enhance their market competitiveness and also meets the environmental protection requirements of society.

3.3.4 Green finance promotes the sustainable development of environmental protection consciousness of logistics enterprises. The implementation of green finance mechanisms can enable logistics enterprises to achieve short-term results in environmental protection, but it is more important to promote the sustainable development of environmental awareness in logistics enterprises. Only logistics enterprises truly realize the importance of environmental protection to the enterprise, and take action to achieve environmental goals, can achieve greater success in the long-term development.

In short, the impact of green finance on the environmental awareness of logistics enterprises is multifaceted, from financial support to the inculcation of environmental protection concepts

### 3.4. Impact of green finance on sustainable business model of logistics enterprises

Green finance, as an emerging financial instrument, has a positive impact on the development of sustainable business model of logistics enterprises. The following are the impacts of green finance on the sustainable business model of logistics enterprises:

3.4.1 Financing support: Green finance provides sustainable financing support for logistics enterprises to help them achieve green development. For example, financing methods such as green bonds and green credit make it easier for logistics enterprises to obtain financial support, thus promoting their green transformation.

3.3.2 Incentive mechanism: The government and financial institutions encourage logistics enterprises to achieve green and sustainable development by providing incentive mechanisms. For example, by issuing green certification and environmental protection incentives, logistics enterprises are encouraged to adopt more environmentally friendly measures in their operations to reduce pollution to the environment.

3.3.3 Management innovation: the introduction of green finance promotes the management innovation of logistics enterprises and drives them to achieve sustainable operation. For example, logistics enterprises can promote sustainable development by introducing green management methods such as green supply chain management and green logistics network.

3.3.4 Green technology innovation: the promotion of green finance also provides support for the green technology innovation of logistics enterprises. For example, green finance can be used to support green technology research and development of logistics enterprises, such as new energy vehicles, Internet of Things technology and other green technology applications, so as to reduce the energy consumption and pollution emissions of the logistics industry.

In conclusion, green finance has an important role in promoting the sustainable business model of logistics enterprises, and helps to promote the development of logistics enterprises towards green and sustainable.

## 4. Discussion and Suggestions

After an overview and analysis of the application of green finance in logistics operations and its impact on sustainability, the following conclusions are drawn:

Green finance has an important role in promoting the sustainability of logistics operations, and can help logistics enterprises transform and upgrade to achieve sustainable development. Green finance can promote logistics enterprises to strengthen environmental awareness, improve environmental quality and enhance social image by providing low-cost financial support, stimulating green innovation, promoting environmental protection technology and fostering environmental protection culture. The application of green finance in logistics operations still faces some difficulties and challenges, such as the lack of support from relevant policies and regulations, information asymmetry, and difficulty in risk assessment.

In response to the above findings, this paper makes the following recommendations:

Government departments should introduce clearer and stronger policies and regulations to support and standardize the application of green finance in logistics operations, increase support for environmentally friendly enterprises, and encourage logistics enterprises to transform and upgrade. Financial institutions should actively promote green financial products and services, improve financial support for environmental protection projects, establish a comprehensive environmental protection financial system, and provide logistics enterprises with a full range of financial services and support. Logistics enterprises should strengthen their awareness of environmental protection, actively explore and apply green logistics technology, improve resource utilization efficiency and environmental quality, establish a good corporate

image, and enhance market competitiveness. Academia should strengthen the research on the application and influence mechanism of green finance in logistics operation, improve the relevant theoretical level and practical application ability, and provide stronger support for the further promotion and application of green finance. To sum up, green finance has an important role in promoting the sustainability of logistics operations and far-reaching influence, and relevant departments and enterprises should strengthen cooperation to jointly promote the application and development of green finance in logistics operations.

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