

The Analysis of Environmental Practices of Chinese Logistics Service Providers Based on the Avoid-Shift-Improve Framework

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Abstract: With the rapid development of the logistics industry, the environmental impact and environmental social responsibility of logistics service providers (LSP) are increasingly being considered by government policies and the public. The environmental management status of domestic logistics service providers and their actions need to be further analyzed. This paper takes domestic logistics service providers as the main body of research, based on the text information of a corporate social responsibility report, and uses the framework of Avoid-Shift-Improve (A-S-I) to make a structural analysis of the environmentally sustainable practices of enterprises in order to provide policy suggestions for improving the green development practices of the logistics industry from the micro perspective of enterprises.

Keywords: enterprise social responsibility, logistics service providers, environmental practices

1. Introduction

Recently, the awareness of green environmental protection is becoming more and more noticeable by the Chinese government. At the Fifth Plenary Session of the 18th CPC Central Committee, General Secretary Xi put forward the vision of innovative, coordinated, green, open, and shared development and emphasized the complete, accurate, and comprehensive implementation of the new development concept in many important speeches. Since then, the new development philosophy has become a new strategic guide for China's economic and social development and an important principle for modernization. Green development is a mode of economic growth and social development that aims at efficiency, harmony, and sustainability. Adhering to green development is a way of respecting the laws of nature. Firms should properly strike a balance between economic development and ecological and environmental protection.

With the development of the logistics industry, the cargo throughput of China's express delivery industry climbed from 5.7 billion to 108.3 billion between 2012 and 2021, an 18-fold increase [1]. Meanwhile, against the social background of the COVID-19 epidemic, the logistics service industry is at the top of the social demand list for emergency allocation of materials, transportation of daily necessities, and emergency distribution of medical supplies. And the increase in demand also brought the logistics industry to the attention of each company, which increased sharply.

The environmentally sustainable development in logistics industry has drawn lots of attention in micro level. This is not only a social responsibility to be fulfilled as a member of society but also conducive to the healthy development of the company itself in the industry. In this paper, by explaining the importance of corporate social responsibility and relying on the relevant green logistics development data of major logistics enterprises, the construction of Avoid-Shift-Improve (A-S-I) model is explored in order to clarify the internal development process of related industries and put forward relevant suggestions and opinions to the relevant industry enterprises.

2. Theoretical Analysis of Corporate Social Responsibility

Social responsibility refers to an organization's responsibility to society. An organization should be operated and managed in a way that benefits society. Social responsibility usually refers to the social obligation that an organization undertakes that is higher than its own goal. It goes beyond the obligations required by law and economy for an organization. Social responsibility is a requirement of organizational management ethics, which is the completely voluntary behavior of organizations out of obligation. If an enterprise consciously undertakes its social responsibilities, it can not only win a good social reputation but also increase its competitiveness and promote its sustainable development. Corporate social responsibility plays an extremely important role in winning a good social reputation, increasing its competitiveness in the market, and promoting the sustainable development of enterprises [2].

When disclosing information related to social responsibility, enterprises should base their disclosures on corporate income, environmental protection, human resource development, participation in social activities, the provision of products and maintenance services, and business ethics. This paper focuses on the green transportation of logistics companies, so this paper will focus on environmental protection.

In the late 19th and early 20th centuries, with the continuous development of enterprises and the deepening of the negative impact of industrial development on society, social attention to enterprises greatly increased. People begin to discuss whether enterprises need to bear certain social responsibilities while exploring their own interests. From 1979, when China promulgated the Environmental Protection Law, to 1992, when the United Nations Conference on Environment and Development was held, China officially issued Ten Countermeasures for Environment and Development. All these actions have clearly indicated that China will implement the strategy of sustainable development.

3. The Environmental Management of Logistics Service Providers in China

3.1 The Challenges in Logistics Industry

As one of the largest logistics markets in the world, China leads the world in carbon emissions caused by cargo transportation. A series of policy directives issued by the state has given logistics companies the convenience of developing green and low-carbon logistics and transportation. But at the same time, the relevant carbon dioxide emissions regulations also put a lot of pressure on logistics companies. Since the beginning of the 21st century, transportation carbon emissions have been on the rise year by year. By 2019, China's annual transport carbon emissions had reached 734.3 million ton [3]. The following are the problems faced by the green development of e-commerce logistics:

(1) Poor compatibility of logistics facilities and low level of equipment technology. At present, the transportation tools and modes of e-commerce logistics lag behind and develop slowly. At the same time, there is a lack of investment in connecting hub facilities between different transport modes and transport systems in different regions. The potential advantages of water transport and civil aviation

transport have not been fully explored. The transportation system lacks a thorough scientific design. This series of problems reflects the lack of importance of green logistics.

(2) Huge obstacles in the management system. The operation of logistics spans different regions and industries, but the management of each region belongs to different government functions. All functional departments lack unified and coordinated strategic thoughts on modern logistics. At present, governments have not formed a special logistics department to plan the development of logistics, which causes the dispersion and waste of logistics resources. The government has no forward-looking thinking about the development prospect of logistics, and to some extent, there is still a phenomenon of letting it develop. In addition, consumers do not have a deep understanding of logistics. What consumers pursue is green consumption, green enjoyment, and green guarantee, but they do not care enough about the link between green channel and logistics.

(3) The lack of compound talents. Since the concept of green logistics has been formed recently, many logistics enterprises have not yet established the concept of green logistics completely, and they do not have the advanced consciousness to undertake social responsibility but symbolically adapt to the demands of the social environment. This is partly due to the low quality of management personnel and business personnel in logistics enterprises. At present, many enterprises lack compound talents with both environmental knowledge and logistics knowledge [4].

3.2 External Environmental Pressures

3.2.1. Institutional Pressures

In recent years, LSPs in China's logistics industry have faced various external environmental pressures, including government orientation, public opinion, customers, communities, consumers, employees, etc.

On the one hand, the government, as the policymaker, systematically manages and restricts the logistics service industry to maintain the stability required by the market. On the other hand, the introduction of various relevant policies also helps logistics service enterprises get better development. The National Development and Reform Commission issued the 14th Five-Year Plan for the Construction of a Modern Circulation System, proposing to strengthen digital empowerment in all aspects of circulation, accelerate intelligent construction and upgrading of circulation facilities, implement the concept of green development, adhere to the new road of green logistics and low-carbon development, and increase the popularization and application of green technology and equipment by 2025 [5].

In 2015, the Standing Committee of the Standing Committee of the National People's Congress promulgated the Postal Law of the People's Republic of China, establishing a framework for the standardized development of the postal industry. It specified postal facilities, services, tariffs, compensation for losses, express business, and other contents, laying a foundation for the development of green logistics. In 2016, the State Post Bureau issued the Plan to Promote the Implementation of Green Packaging in the Express Industry, aiming to implement green packaging in the express industry, improve the utilization rate of express packaging resources, and reduce packaging consumption. In 2017, ten ministries and commissions, including the State Post Bureau, the National Development and Reform Commission, and the Ministry of Science and Technology, jointly issued the Guidelines on Promoting Green Packaging in the Express Industry. By 2020, the proportion of biodegradable green packaging materials will be as high as 50%, a special express packaging recycling system will be basically established, and the utilization rate of electronic waybills will reach over 90%. The average package consumables per piece of express delivery are reduced by 10%. In 2020, the State Administration for Market Regulation, the National Development and Reform Commission, the Ministry of Science and Technology, and other eight ministries jointly

issued the Opinions on Accelerating the Green Transformation of Express Packaging, proposing that by 2022, the legal and regulatory system in the field of express packaging should be further improved and an incentive and restraint mechanism for express packaging management should be basically formed. It aimed to formulate and implement mandatory national standards for the safety of express packaging materials and establish a unified, standardized, and binding standard system for green express packaging. It was also devoted to standardized management of e-commerce, and express delivery has been widely implemented. 85 percent of e-commerce express packages do not need to be packaged again, and 7 million packages are used for recycling express delivery. The standardization, greening, and recycling of express delivery packages have significantly improved. By 2025, laws, standards, and policies adapted to the green concept will be fully established in the field of express packages; e-commerce express packages will basically no longer be packaged twice; and the application scale of recyclable express packages will reach 10 million. Significant progress will be made in packaging reduction and in developing new models and forms of green recycling. Express package will basically be realized, and green transformation will take place. These policies directly or indirectly require the logistics service industry to carry out mandatory green development [6].

3.2.2. Non-Institutional Pressures

Regarding to the non-institutional pressures, green development is a very important part of the current logistics market. Enterprises that can achieve higher results in energy conservation and emission reduction will have a huge impact on a series of factors, such as their economic benefits and costs. Nowadays, as a key node linking the upstream and downstream industries in the logistics industry, the logistics service provider is an important factor for upstream and downstream enterprises, as its transportation mode, packaging, storage, and other links are low-carbon and efficient. At the same time, people are paying more and more attention to whether a logistics company has a good social and brand reputation. Whether a logistics company is recognized by the public in the aspect of energy conservation and emission reduction and whether the public agrees with the performance of this company will determine how much share this company can occupy in the market [7].

Taking the turnover of enterprises as an example, the first-echelon logistics service enterprises, such as SF Express and Jingdong, have a turnover of more than 100 billion yuan in logistics-related services. However, the turnover of the second-tier logistics service enterprises, such as YTO, is only 10 billion to 100 billion. At present, Chinese logistics industry's new threat comes from foreign capital enterprises. With the further development of China's opening to the outside world, more and more foreign companies enter the market. With their strong capital and scientific and technological strength, they become the biggest threat to domestic private logistics enterprises.

From the competition between existing enterprises, the logistics industry in China has experienced rapid growth and development in recent years, both in terms of the number of competitors and industry growth rate. As the main body of green logistics, all enterprises attach the same importance to green logistics, but due to the limitation of their share in the industry, the cost and available funds for green logistics development are different.

The rapid development in the past decade and the sudden emergence of the novel coronavirus epidemic at the end of 2019 have greatly changed the industry. The construction of third-party platforms such as Taobao and Tmall has provided sufficient conditions for e-commerce. In the traditional offline shopping mode, in addition to the packaging of the goods themselves, in most cases, plastic bags, handbags, and other items to take away the goods they buy. However, in the current e-commerce environment, the packaging of many logistics goods is excessive, which is quite serious for resource waste and environmental damage.

For general consumers, people are willing to support the development of green logistics. In the survey of users' green logistics service experiences in 2021 conducted by the research institute under Beijing Business News, most users are willing to pay for the green logistics packaging, among which only 18% cannot accept the payment for the use of environmentally friendly materials, and the remaining 82% are willing to pay for the use of environmentally friendly materials, which shows that people attach great importance to environmental protection.

4. Environmental Practice Analysis Based on the A-S-I Framework

4.1 The A-S-I Framework

In this paper, the "Avoid-Shift-Improve" (A-S-I) framework is adopted to better express the industry terms. That is to say, "avoid" means clean and efficient logistics, "shift" means transportation mode, and "improve" means transportation equipment improvement. Since the transportation in the transfer part of the logistics industry cannot be reformed in large quantities in recent years, this paper does not carry out a large number of ink analysis in the transfer part; instead, it focuses on avoiding and improving the part.

A clean and efficient logistics strategy aims to optimize the freight movement itself. These strategies focus on improving the efficiency of logistics systems or networks by improving vehicle utilization, reducing empty mileage, and optimizing driving routes without reducing freight volume.

A clean and efficient transport mode strategy aims to reduce vehicle energy consumption and emissions by converting transport modes to transport modes with lower energy consumption and emissions intensity. These strategies often include switching from trucking to rail, river, or short sea freight and from air to sea freight.

A clean and efficient transport equipment strategy aims to reduce the energy consumption and emission intensity of transport equipment and fuels. First, companies can apply cleaner and more efficient technologies, such as electric power systems, waste heat recovery, aerodynamic optimization, low rolling resistance tires, and emission control technologies, in trucks. On ships, engines and propulsion efficiency, electrification, and aerodynamics can be used. Second, environmental emissions can also be improved by changing the way transport equipment operates, for example, by making trucks run more energy-efficiently and ships travel at slower speeds. Finally, optimizing freight activities also requires reliance on cleaner fuels, such as ultra-low sulfur fuels, biofuels, and electrification.

4.2 Environmental Practice Analysis of Chinese LSPs

Based on the public information about the environmental responsibility of representative domestic logistics enterprises, this study presents the specific environmental practices of enterprises in a structured manner through the A-S-I framework, as shown in the Table 1.

Table 1: Environmental practice analysis.

Enterprise	A (Avoid)	S (Shift)	I (Improve)
SF Express	<ol style="list-style-type: none"> 1. Reduce the carbon footprint per ticket by 70% by 2030. 2. Plan transportation routes to reduce transportation energy consumption. 3. To achieve accurate matching of vehicles and goods, use predictive navigation and fuel-saving methods to reduce transportation energy consumption. 4. In 2021, SF Express will have saved 34,000 tons of base paper, 6,200 tons of plastic, and 73,000 tons of carbon emissions. 	<ol style="list-style-type: none"> 1. Self-developed UAV to provide efficient, economical, and low-carbon logistics services. 2. Distributed new energy vehicles in 22 provinces across the country. 3. Based on the existing Feng-Box, SF Express has introduced a carbon-neutral product, the II-box, which uses PP honeycomb panels, a more recyclable material. 	<ol style="list-style-type: none"> 1. Increase 55% in carbon efficiency by 2030; the self-built airport can save about 52,000 tons of aviation fuel every year. 2. The renewable energy rate of the airport has reached 25.6% and the electrification ratio of traffic has reached 80.35%. After operation, SF Express reduces carbon emissions by more than 26,200 tons per year. 3. The encapsulation ratio of slimming tape reaches 99.87%, and the non-secondary packaging rate of e-commerce express mail reaches 99%.
YTO	<ol style="list-style-type: none"> 1. Strictly control the purchasing and receiving links for packaging and reduce the secondary packaging at the receiving link. 2. Express package mimeograph mask reduced by 1/3; defective rate decreased by 10%; cost savings of 1.2 percent each. 	<ol style="list-style-type: none"> 1. The total number of recyclable transit bags in use is about 6.9 million. 2. By the end of 2021, the company's electronic single-sided use rate exceeded 99.9%, and the usage rate for single-sided electronic communication reached more than 95%. 	<ol style="list-style-type: none"> 1. Recyclable express boxes are made of recyclable materials and are 100% recyclable, with an average service life of 7-8 months and more than 50 cycles. 2. Specially customized 200,000 full biodegradable plastic packaging bags.

Table 1: (continued).

YUNDA	1. Using self-developed “Shen Xing Zhe” vehicle operation monitoring, each vehicle reduced fuel consumption by more than 3%, reducing carbon dioxide emissions by more than 4,200 tons.	1. Pilot use of RFID environmental bags and by the end of 2020, the circulation of RFID-enabled eco-friendly bags in the whole network will be nearly 8 million, and the utilization rate of distribution centers will reach 95%.	
Jingdong	1. Green flow boxes and other circular packaging have been used 200 million times and it have led the industry to reduce the consumption of disposable packaging by nearly 10 billion. 2. More than 2.8 billion electronic invoices were issued, saving enough paper to cut down more than 310,000 adult trees. 3. JD Cloud’s new-generation green data center has achieved an annual average power use efficiency (PUE) of less than 1.1, infrastructure energy consumption savings of 30%, and a total carbon emission reduction of 10%.	1. Jingdong has completed the installation of photovoltaic power generation systems in the first batch of 12 smart industrial parks. 2. More than 20,000 new energy logistics vehicles have been deployed in more than 50 cities across the country.	1. Plan to completely replace its logistics vehicles with new, energy-efficient ones by 2030. 2. To achieve 100% environmentally friendly and renewable packaging materials by 2030.

As can be seen from Table 1, leading domestic LSPs have taken relevant measures for the development of green logistics in recent years. It is not difficult to see that SF Express and Jingdong have achieved remarkable results in “avoid” and “improve” parts. It can be seen that most companies avoid a series of processes such as packaging, transportation, and delivery to avoid energy conservation and emission reduction as well as research and development of new environmentally friendly materials. In the “shift” part, although there is still a lot of room for improvement in China, at present, domestic mainstream companies mainly improve this part through the application of new technologies, such as drones, new energy delivery vehicles, new freight materials, etc. Finally, in the “improve” part, these companies are basically based on energy conversion, energy use rate, carbon emission efficiency improvement, and other measures. As can be seen from the table, the improvement measures involved in each module of SF Express in the Avoid-Shift-Improve framework are relatively comprehensive, and it can also be seen that SF Express has made outstanding achievements in emission reduction. For example, the emission reduction optimization of airports, the utilization of big data and satellite systems to optimize routes, and other measures are all technologies that are relatively ahead of their peers. Jingdong pays more attention to new energy

transportation technology and reduces carbon emissions through the low-carbon selection of building materials. However, YUNDA and YTO, as the express service providers of "three and one", still occupy a part of the market. However, up to now, their performance in reducing carbon emissions is indeed inferior to that of SF Express, Jingdong, and other more advanced large-share logistics companies.

As a publicly listed company, its social responsibility is supervised by the masses. Therefore, SF Express and Jingdong have invested a lot of money in energy conservation, emission reduction, low-carbon, and green transportation to research and develop related products or technology improvements so as to enhance their green development efficiency. Their green economic benefits also reflect that green development will not make consumers dissatisfied or reduce the economic benefits of their own companies. On the contrary, it will help the companies improve their reputation in the industry and obtain the support of relevant policies from the government.

5. Conclusion

By analyzing the internal and external pressures on China's LSP and using the Avoid-Shift-Improve framework model to analyze the content of green practices in the social responsibility reports of representative companies in the industry, this paper presents the focus and characteristics of the current domestic LSPs in terms of environmental practices in a structured way.

Based on the analysis of this paper, the following conclusions can be drawn: First, domestic LSPs pay more attention to the environment and green development. Second, the green development process of LSPs in the industry is uneven, facing environmental management pressure from different stakeholders depending on their size and business structure. These different levels of the development process led to the service content of domestic LSPs being faulty, making it easy for a few leading enterprises to monopolize high-end or even full-priced services. Thirdly, with the development of the times and the progress of science and technology, the environmental management of LSPs has been given more and more attention by ordinary consumers. Policy makers should carry out strict management and preferential policies at the same time, so as to promote healthy development competition within the industry and expand the brand influence of domestic LSPs in Asia and even the global scope.

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