

Environmental Performance of Express Delivery Enterprises in China

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Abstract: In recent years, with more and more attention to environmental issues, the study of green sustainable development has been more and more attention. In addition, the current definition of green sustainable development is not uniform, how to evaluate the degree of green sustainable development of an enterprise has become a hot topic of domestic and foreign scholars. This paper, from the perspective of express logistics industry, establishes the environmental performance of express delivery enterprises in China from two aspects of green sustainable development status and development ability, and determines the weight through expert questionnaire. Hope to provide theoretical basis for the green and sustainable development of China's express delivery company.

1. Introduction

With the development of e-commerce, China's express logistics industry has also achieved leap-forward development. According to statistics from the state post office, China's express delivery volume reached 50.5 billion pieces in 2018. Express delivery has increasingly become an indispensable part of our daily life. However, while we enjoy the convenience brought by express delivery, the express logistics industry has also caused great damage to our living environment. At the present stage, the imperfect basic logistics equipment, the scientific distribution plan and the high level of logistics informatization lead to the great destruction of the logistics industry to the environment. More and more people realize that China's express logistics industry must realize green and sustainable development as soon as possible.

Green logistics is a new concept put forward in the mid-1990s. Research at home and abroad for green sustainable logistics mainly aimed at such as packaging, transportation and distribution of a single study logistics function elements, such as Zheng Weiyan believe that the development of green logistics is mainly aimed at the excessive packaging and packaging recycling mechanism, and study design a reverse logistics network to improve the utilization rate of recovery and repetition of

the express package [1]. Or to study from the perspective of supply chain green sustainable logistics mode, such as Sheu and Chou put forward a kind of green supply chain management (G - SCM) comprehensive logistics operation model, for a given green supply chain integration of logistics and the corresponding second-hand products to optimize operation of reverse logistics system, not only reduces the environmental impact of logistics activities, also increased the logistics enterprise's profit[2]. These studies lack the green and sustainable development of express logistics industry from the perspective of industry. In addition, how to evaluate the green sustainable development degree of express logistics industry has always been the research focus of domestic and foreign scholars. Peterson pointed out that since we will never really know whether we have achieved sustainable development, we will continue to explore this issue and continue to focus on the profitability of medium - and short-term measures[3].

In this paper, from the perspective of logistics industry, a set of green sustainable development index system of express logistics industry is developed to investigate the green sustainable development of China's express logistics industry by analyzing the constraints and implementation methods of green sustainable development in various operational links of express logistics industry.

The sustainable development of express logistics industry needs to be considered from two perspectives: the development status of express logistics industry and the green sustainable development ability of express logistics industry. In this paper, the the environmental performance of express delivery enterprises in China is developed from these two perspectives. A certain index is selected for evaluation from each Angle, and the weight is determined by means of expert questionnaire.

2. Indicators of Environmental Performance

The environmental performance of express delivery enterprises in China includes two aspects: development status and development capacity. The following is a green sustainable development analysis from the perspective of express logistics industry, so as to determine the corresponding indicators.

From the analysis of the operation links of express delivery company, such as receipt, packaging, sorting, transportation, storage and distribution, the development status is mainly considered from the two aspects of resource consumption and pollution emission.

In terms of receiving, the rapid growth of express delivery demand leads to express delivery company to vigorously expand the scope of receiving outlets. Traditional logistics services use paper orders, and there is a huge demand for paper every day. In terms of packaging, in order to reduce the rate of package breakage, express delivery companies often adopt the method of "excessive packaging" and reduce the rate of breakage through a large number of plastic packaging and plastic foam filling. In sorting, at present, the sorting of express delivery company generally requires a large number of sorting staff to carry out manual operation, which consumes a large amount of human resources. At present, parcel transportation is mainly carried out by fuel vehicles, fuel consumption cannot be ignored. In terms of warehousing, under the current traditional logistics operation environment, a large increase in the amount of logistics parcels will inevitably require an increase in storage area. Considering the cost of land, logistics companies tend to choose storage sites in the

suburbs far from the city. The warehouse layout and operation mostly rely on experience, without scientific design and planning. At the same time, the water, electricity and other facilities of the warehouse will not choose the technical equipment with high one-time purchase cost, but will choose the equipment with relatively low purchase cost but high power consumption. In terms of distribution, there are three main modes of distribution in China at present: door-to-door delivery, self-pick-up and self-pick-up cabinet. In order to meet the delivery demand, express logistics companies invest a large number of delivery vehicles, which travel through the city's looting alleys and occupy a large amount of road resources. At the same time, the express logistics industry invests a large number of intelligent express cabinets and self-extracting points on the street, occupying a large amount of land resources. The increase in delivery vehicles and pick-up points not only represents an increase in the number of express deliveries per capita, but also puts great pressure on urban traffic.

As you can see, along with the growing demand of express delivery, express enterprise scale increasing, the dosage of the express waybill, Courier bags, boxes, the number of private truck, the consumption of fuel, land and other resources also increased, the consumption of these resources is not only the consequences of the lack of resources, also can bring serious environmental pollution. Use of paper surface, for example, a single cause deforestation, mass use of disposable plastic packaging will aggravate the white pollution and fuel car use will aggravate air pollution and greenhouse effect and unscientific storage location and path planning could lead to the increase of transportation distance, "stall" to the point will affect the city appearance. Based on the above analysis, the indicators selected in this paper to measure the development status of express delivery company include paper surface single consumption, plastic packaging consumption, transport vehicle exhaust emissions, noise level of transport vehicles, the length of transport routes, storage center land area and the number of "stall" self-pick-up points, etc.

Development ability is considered from the perspective of stakeholders such as enterprises, governments and the public, and from different perspectives, how to better realize the green and sustainable development of express logistics industry. From the perspective of express delivery company, they must think about their future development direction while continuously expanding their development scale and market. With the development of e-commerce, the promotion of the Internet and people's yearning for a better life and high-quality environment, the development of China's logistics industry can no longer rely on resources, manpower and scale as it did more than a decade ago. This is an informationized society, an intelligent society, and a society where people pursue "green". Express delivery company must comply with the tide of The Times and respond to the national call if they want to achieve green and sustainable development. From the perspective of the government, the development of China's green logistics, if only rely on the power of the free market, there will be market failure. Green and sustainable development requires enterprises to pay the cost of human and material resources, which will increase their operating costs. However, in the competition dominated by the market economy in China, every enterprise's behavior is basically dominated by economic benefits. Therefore, the government must play a macro-control role to guide the green and sustainable development of China's logistics industry. From the perspective of the public, logistics, as a service industry, is ultimately public oriented and serves the public. To realize green and sustainable development of logistics industry, the public must have a high degree of

recognition on green logistics. Based on the above analysis, this article selects the indices for express logistics enterprise development ability, including enterprise informatization degree, the use of new energy vehicles, green packaging and the packaging recycling mechanism, the degree of automation of logistics operation, warehouse in green energy-saving facilities, scientific path planning and warehousing location, new delivery methods, policies, standards, policy incentives and public perception of green logistics.

After determining the indicators, we visited government research institutions, enterprise leaders and academic scholars in relevant fields, and determined the weight of each indicator through scoring by experts

3. Method And Data Collection

The expert questionnaire is divided into two parts. In the first part, experts are asked to score all the 17 indicators proposed in this paper with a score of 1-5 to determine the weight of each indicator. The second part, based on the experts' understanding of the industry, puts forward some factors that they think should be considered in evaluating the green and sustainable development of express delivery company.

In this survey, a total of 50 questionnaires were issued to government personnel, industry managers and related researchers in the logistics industry, and 31 valid questionnaires were collected. These questionnaires cover the authoritative figures of enterprises and institutions such as Provincial Logistics Association, Shanghai Post Institute, Samsung International Logistics, Jingdong, Jiuyi, XianShengHuo, Shuangyi Consulting, Yto, Zto, Beijing University Of Posts And Telecommunications, Xi 'An University Of Posts And Telecommunications, etc.

4. Data Analysis

According to the score in table 1, it can be clearly seen that in the development of the express logistics industry, the amount of plastic packaging has the greatest impact on the environment, followed by the exhaust emission of transport vehicles. Experts' scores also show that the noise level of transport vehicles has the least impact on the environment.

From the scores in table 2, it can be clearly seen that for the express logistics industry, policy incentives, green packaging, packaging recycling, the use of new energy vehicles, scientific path planning and storage location are all very important for promoting the green and sustainable development of express delivery company.

Table 1 scores of expert questionnaire.

Topic\options	Very serious	Nothing serious	general	serious	very serious	The average score
Quantity of paper order	1 (3.23%)	2 (6.45%)	14 (45.16%)	11 (35.48%)	3 (9.68%)	3.42
Amount of plastic packaging	0 (0%)	0 (0%)	7 (22.58%)	14	10	4.1

				(45.16%)	(32.26%)	
Emissions from transport vehicles	0 (0%)	3 (9.68%)	7 (22.58%)	15 (48.39%)	6 (19.35%)	3.77
Noise levels of transport vehicles	1 (3.23%)	4 (12.9%)	17 (54.84%)	8 (25.81%)	1 (3.23%)	3.13
Length of transport route	0 (0%)	4 (12.9%)	17 (54.84%)	9 (29.03%)	1 (3.23%)	3.23
Storage center area	0 (0%)	5 (16.13%)	17 (54.84%)	8 (25.81%)	1 (3.23%)	3.16
Amount of "Street stall " self-raising	0 (0%)	5 (16.13%)	14 (45.16%)	9 (29.03%)	3 (9.68%)	3.32

Table 2 scores of expert questionnaire

Topic\options	Very unimportant	unimportant	general	important	Very important	The average score
Degree of enterprise informatization	1 (3.23%)	0 (0%)	5 (16.13%)	8 (25.81%)	17 (54.84%)	4.29
The use of new energy vehicles	0 (0%)	0 (0%)	3 (9.68%)	15 (48.39%)	13 (41.94%)	4.32
Green packaging and packaging recycling mechanism	0 (0%)	0 (0%)	2 (6.45%)	13 (41.94%)	16 (51.61%)	4.45
Automation of logistics operations	0 (0%)	0 (0%)	6 (19.35%)	11 (35.48%)	14 (45.16%)	4.26
Green energy saving facilities in warehouse	0 (0%)	1 (3.23%)	6 (19.35%)	15 (48.39%)	9 (29.03%)	4.03
Scientific path planning and storage location	0 (0%)	0 (0%)	4 (12.9%)	13 (41.94%)	14 (45.16%)	4.32
New mode of distribution	0 (0%)	0 (0%)	8 (25.81%)	14 (45.16%)	9 (29.03%)	4.03
Policy standards	0 (0%)	0 (0%)	5 (16.13%)	13 (41.94%)	13 (41.94%)	4.26
Policy incentives	0 (0%)	0 (0%)	2	12 (38.71%)	17 (54.84%)	4.48

			(6.45%)			
Public recognition of green logistics	0 (0%)	0 (0%)	8 (25.81%)	12 (38.71%)	11 (35.48%)	4.1

After normalization, this paper obtains the weight of these indicators. Details are given in table 3.

Table 3 weight of evaluation indicators based on expert questionnaire

Level	indicators	Weight
The development state of express logistics industry	Quantity of paper order	0.063441
	Amount of plastic packaging	0.076056
	Emissions from transport vehicles	0.069934
	Noise levels of transport vehicles	0.058062
	Length of transport route	0.059917
	Storage center area	0.058618
	Amount of "Street stall " self-raising	0.061586
Green and sustainable development potential of delivery company	Degree of enterprise informatization	0.055706
	The use of new energy vehicles	0.056096
	Green packaging and packaging recycling mechanism	0.057784
	Automation of logistics operations	0.055316
	Green energy saving facilities in warehouse	0.05233
	Scientific path planning and storage location	0.056096
	New mode of distribution	0.05233
	Policy standards	0.055316
	Policy incentives	0.058173
	Public recognition of green logistics	0.053239

5. Expert Opinion

According to the expert's grade, all index is "general" above. We can preliminarily determine that the selection of evaluation indicators is scientific. Then, this paper analyzes the additional factors that experts think should be considered to evaluate the sustainable development of green logistics. After scoring the environmental performance established by experts in this paper, the expert questionnaire specially designed a blank filling question, so that experts can evaluate and supplement the indexes established in this paper. The design of this part of the questionnaire is mainly to prevent myself from omissions of some important factors due to my lack of experience in the establishment of the environmental performance. Meanwhile, the scientific nature of the index construction in this paper

supply chain enterprises; Third, CaiNiao and other third party companies to promote. Among them, joint distribution is a new type of distribution. Resource integration and cooperation and collaboration between supply chain enterprises are related to the sustainable development of the whole supply chain. However, this paper only considers the green sustainable development of express delivery company. The promotion of CaiNiao and other third-party companies can indeed promote the green and sustainable development of the express logistics industry. In fact, the promotion of CaiNiao and other companies is to coordinate these express delivery company from the overall perspective of the supply chain. Therefore, it can be seen that the analysis in this paper is comprehensive enough.

6. Conclusions

In this paper, from the Angle of the express logistics industry, by analysing the green express logistics industry each operation link the restricting factors and the implementation of sustainable development, formulated the environmental performance of express delivery enterprises in China, through expert questionnaire design and issuing of collection, determine the weight of the indexes. At the same time, the credibility and scientificity of the environmental performance of express delivery enterprises in China established in this paper are verified through the form of expert supplement, and the problem that the index system is not comprehensive due to my insufficient personal level is also prevented. It provides a strong theoretical basis for the following research on the sustainable development of green logistics in China's express delivery industry.

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