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Research on Green Express Packaging in the Era of Online Shopping

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Abstract: With the rapid development of electronic commerce in China, the rapid increase in the number of express packages has brought about great environmental problems while bringing great convenience to us. Based on the concept of green logistics, this paper discusses the problems of unreasonable express packaging materials, excessive packaging and the absence of packaging waste recovery system from both theoretical and practical aspects, and puts forward the countermeasures to promote the green express packaging in the era of online shopping. This paper aims to find the ways, measures and methods to solve the problems of express packaging, so as to realize the "load reduction" and "greening" of express packaging in China.

Keywords: green logistics, express, packaging

1. INTRODUCTION

At present, the rapid development of e-commerce and logistics industry has brought great convenience and efficiency to consumers. According to the statistics of relevant departments in December 2015, the number of online consumers in China is as high as 413 million, with the consumption amount reaching 388 billion yuan. China's express delivery industry has become the first in the world. In 2016, China's express delivery business exceeded 30 billion pieces for the first time, reaching 31.28 billion pieces, with a year-on-year growth rate of 51.4%. The growth rate ranks among the top in the modern service industry and has become the highlight of China's new economy.^③ However, behind the rapid development of express delivery industry, existing the serious pollution of ecological environment, the huge amount of packaging consumption produced a huge amount of packaging waste. Therefore, how to effectively deal with a large number of express packaging waste, reduce the waste of resources, reduce the pollution and damage to the environment, promote the green development of express packaging has become an urgent problem to be solved by the whole society.

2. RESEARCH STATUS AT HOME AND ABROAD

Many domestic scholars have studied the problems of express packaging from the aspects of green logistics, environmental resources, recycling and reuse of express packaging and other aspects. Jiang Yiyang (2017) studied the packaging of express delivery industry from three aspects of the meaning of green logistics and the significance of developing green logistics, the current situation and problems of green logistics in China and the corresponding countermeasures^[1]. Chen Yingyan (2014) analyzed the main problems in express packaging such as high investment, high energy consumption, low quality and low efficiency, and proposed that designers should conduct targeted research to promote the development and improvement of express packaging^[2]. Zhao Xi (2016) studied the recycling and reuse of express packaging and put forward specific countermeasures to seek the common healthy development of express packaging and green logistics^[3]. Zou Xiao (2016) believes that change packaging methods, adopt biodegradable and easily recyclable packaging materials, establish recycling logistics of wastes, recycle uniformly and deal with packaging wastes^[4]. Ge Rui (2017) proposed that the focus on the development of logistics industry in all countries should be to carry out technical research on new green packaging materials actively and develop new materials that are convenient for recycling^[5].

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^③ Data source: 2016 China express development index report.

Many foreign scholars put forward the innovative packaging design concept aiming at the environmental evaluation of green packaging. David Romero (2014) believes that the supervision of government departments plays a crucial role in whether an enterprise can do a good job in packaging recycling. It can adopt tax control and legal supervision methods, and also use the government's publicity of packaging recycling education to improve people's awareness of recycling and environmental protection^[6]. Fiji Hosoda (2015) takes LCA as the ideological guidance, combines the impact of packaging life cycle on the environment, innovates the mode of packaging design, and selects the optimal packaging design scheme^[7]. Damjan Krajnc, Peter Glavi (2015), based on the concept of green culture, attaches importance to the implementation of environmental protection measures, and takes Dupont company as an example to advocate the construction of green enterprises^[8]. Giuseppe Di Vita (2016) believes that the Life Cycle Assessment, which has been included in the international standard, should be adopted in the objective evaluation of green packaging in terms of environment^[9]. Ingo Gestring (2017) points out that cooperation between manufacturers and logistics service providers should be promoted. In the construction of recycling system, mutual cooperation can be achieved to reach a win-win situation and recycling can be stimulated by interest attraction^[10].

3. CURRENT SITUATION AND MAIN PROBLEMS OF PACKAGING IN EXPRESS DELIVERY INDUSTRY

3.1 Current situation of packaging in express delivery industry

Packaging plays a role in protecting commodities, facilitating transportation and transmitting commodity information in the circulation process of logistics. At present, the express industry uses four major packaging materials: express waybills; packaging materials; filling materials (foam, foaming plastics etc); auxiliary materials (label stickers, tape are the most common).

According to the statistics of the state post bureau, in 2016, China's express delivery industry consumed 20.7 billion waybills, 3.1 billion woven bags, 8.268 billion plastic bags, 3.305 billion envelopes, 9.922 billion packing cases, 16.985 billion meters of tape, 2.977 billion internal fillings, and the tape used could circle the earth more than 380 times.^④In the whole express delivery process, the necessary materials for packaging are mostly disposable consumables, which will inevitably become waste after using. Packaging waste has become the fourth largest source of pollution in China, accounting for more than 30% of urban solid waste. Therefore, it is urgent to realize reasonable "load reduction" and "greening" of express package.

3.2 Main problems in packaging of express delivery industry

3.2.1 The environmental awareness of express delivery participants is not strong

Nowadays, the lack of awareness of environmental protection has become one of the important problems in the express industry. Not only do online shoppers lack environmental awareness, but also companies involved in logistics. Most logistics enterprises only care about the competition of express delivery, but ignore the environmental pollution caused by the non-standard use and discard of express packaging in the process of transportation. For e-commerce or express delivery enterprises, on the premise of ensuring the integrity of express delivery, they also have certain requirements on the appearance of packaging. For this reason, packaging materials with low cost, low quality and high pollution become the first candidate of these enterprises, which also make packaging manufacturers lose enthusiasm for developing new green materials. This is exactly one of the key factors causing environmental pollution. The government lacks supervision and control over logistics and express packaging. The lack of legal rules and regulations lead to the random packaging of goods in the

^④Data source: 2017 China express green packaging development status and trend report

e-commerce and express delivery industries without clear specifications, which results in unnecessary environmental pollution.

3.2.2 Unreasonable selection of packaging materials

The quality of packaging material determines whether it will cause pollution to the environment, which is one of the key problems of packaging. Many enterprises, considering the cost problem of the company, mostly choose the material with high pollution and low regeneration value. It is reported that a customer in Beijing had improperly disassembled the package and his mouth was exposed to the packaging material. One day later, his mouth festered and he could not live normally. This shows that the harm of inferior packaging material is serious.

3.2.3 Excessive or improper packaging is serious

In the process of express delivery circulation, express delivery will go through multiple rounds of sorting and transportation. In terms of the current industry conditions, in order to ensure the integrity of express items, strengthening express packaging has become the current cost of the lowest, the fastest effect of a method. Therefore, most logistics enterprises will take the following measures: increase the filler (foam ball, vacuum pad, etc) to act as buffer; thickening packing; thicken the outer package. In the face of fierce competition in the industry, it is undoubtedly a disguised increase in the operating costs of logistics enterprises, weaken the soft power of the company.

3.2.4 Absence of packaging waste recovery system

As far as the current situation is concerned, China still needs to study and understand the concept, conditions and channels of packaging recycling. First, the lack of recycling awareness. After receiving the express delivery, many online shoppers often throw the express box into the garbage can, and rarely recycle the express box and arrange it in a standard way. Second, the added value of recycling is not high. Different materials, quality and specifications of packaging will greatly affect the cost of waste recycling, and the available value is minimal. In terms of the cost and profit of packaging itself, there is no obvious change in its value-added space. At present, the vast majority of express delivery enterprises have not implemented the packaging recycling system, and people with environmental awareness can not properly deal with packaging waste.

3.2.5 Express product packaging lacks policies, regulations and standardization guidance

At present, the laws and regulations related to the express industry packaging products industry are not perfect, and the specific standard system is not complete. There are only relevant norms and systems in the warehousing and recycling of express delivery, while there are no specific requirements in other aspects involved in the logistics industry. In terms of the laws and regulations promulgated by our country at present, there are still many problems in the practical operation of logistics industry, such as low practicability, difficulty in work coordination and lax law enforcement. However, problems such as lax supervision, poor quality and safety of packaging materials, and non-standard production of enterprises will have certain impacts on social and public safety and environmental protection.

3.2.6 Lack of professional green logistics talents

Despite the explosive development of China's express delivery industry in recent years, China's logistics industry is lagging behind in terms of time, and some advanced concepts cannot match the technical facilities in the overall environment. As a result, China's overall level is still in a backward state compared with the world. Coupled with the related education allocation is insufficient, so that the entire industry is extremely short of professional talent. In addition, education is not attached enough importance to logistics management, social training institutions are not professional enough, and the overall education level of practitioners is not high. Nowadays, the leading group of logistics industry is inclined to the grass-roots positions, while the technical

content of grass-roots positions is low and the innovation degree is slow to develop, which is not enough to attract professional and high-quality talents.

4. ATTITUDES AND ANALYSIS OF ONLINE SHOPPERS TOWARDS GREEN EXPRESS PACKAGING

The data of this study are mainly from online survey. A total of 303 valid questionnaires were collected through the SO JUMP. The samples were reasonably distributed and representative in dimensions of gender, age and education degree.

4.1 Sample statistical description

Table 1. Demographic distribution

Gender	Male	129	42.57	Professional	Students	186	61.39
	Female	174	57.43		Teachers'	26	8.58
Age	Aged 18 and below	14	4.62		Soldier	4	1.32
	19 ~ 25 years old	249	82.18		Business, service personnel	16	5.28
	26~35 years old	23	7.59		Professional and technical personnel	20	6.6
	36~45years old	5	1.65		Cadres of government organs and institutions	8	2.64
	46~60 years old	9	2.97		Other employees	26	8.58
	More than 60 years of age	3	0.99		Retirees	1	0.33
	Education level	High school and below	50		16.5	Freelancer	16
University college		51	16.83				
University degree		191	63.04				
Postgraduate and above		11	3.63				

As it can be seen from table 1, the proportion of male and female in the sample is close to 1:3, and the distribution is relatively balanced. The age of the population in the survey is mainly between 19 and 25 years old, 26 and 35 years old, accounting for 89.77% of the respondents. People aged 19 to 25 are mostly college students or freshmen entering the workplace after college graduation. Comparatively speaking, they pay more attention to online shopping and participate in it than other social groups of other ages. People aged between 30 and 39 generally have stable jobs and certain economic income. For them, online shopping is a convenient shopping mode. As for the degree of education, most of the respondents have a bachelor's degree, accounting for 63.03% of the total number. It can be seen from the table that such groups as students, teachers and other practitioners have the highest online shopping participation, accounting for 61.39%, 8.58% and 8.58% respectively. Mainly because these groups can accept and adapt to new things. In general, the sample composition selected in the survey is reasonable, and the collected data is representative for the study of packaging problems in the express industry.

4.2 Descriptive analysis of data

Table 2. Follow-up treatment and opinions of online shoppers on express packaging

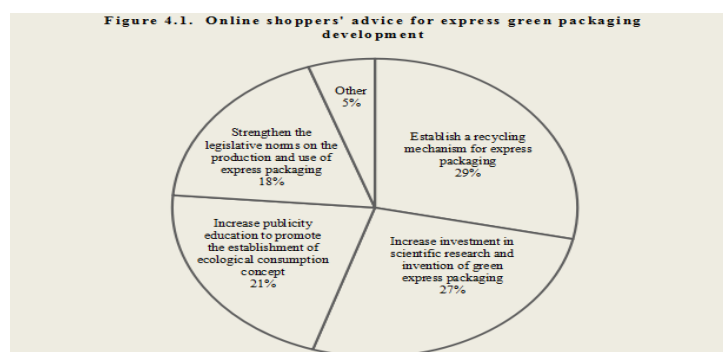
How do you usually handle packaging			What are the complaints about the express package		
Options	Subtotal	The proportion	Options	Subtotal	The proportion
Directly to throw away	239	78.88%	Security	134	44.22%
Save and sell junk	26	8.58%	Appearance	119	39.27%
According to the actual situation made into crafts or storage boxes	38	12.54%	Later use	140	46.20%
			Open the way	104	34.32%
			Environmental protection	143	47.19%
Reasons not to use the box			Are you willing to use used cartons		
Options	Subtotal	The proportion	Options	Subtotal	The proportion
The packing is badly damaged	137	45.21%	Willing to	224	73.93%
Packaging does not meet their aesthetic requirements	49	16.17%	Don't want to	79	26.07%
Take up the space	36	11.88%			
There is no demand	81	26.73%			

As it can be seen from table 2, 78.88% of online shoppers throw away packaging as garbage in daily life. According to the actual situation, 21.12% of online shoppers made handicrafts, stored boxes or sold them as waste products. According to the survey, the main reasons for not using express boxes are serious packaging damage or no corresponding demand (71.94%). With the improvement of life quality, online shoppers have more requirements and cartons take up more space, so many people refuse to reuse express boxes. However, the survey found that nearly 74% of online shoppers accept the reuse of cartons, which reflects the improvement of people's environmental awareness.

Table 3. Online shoppers on express green packaging support statistics

Will you choose to use environment-friendly packaging materials		
Options	Subtotal	The proportion
Will	270	89.11%
No matter	27	8.91%
Will not	6	1.98%
Do you think it necessary to standardize express packaging		
Options	Subtotal	The proportion
Necessary	263	87.79%
Unnecessary	17	5.61%
No matter	23	6.50%
Do you support express packaging recycling and reuse		
Options	Subtotal	The proportion
Support	266	87.79%
Does not support	17	5.61%
No matter	20	6.60%

It can be seen from the data listed in table 3 that online shoppers hold a supportive attitude towards the development of green packaging. In terms of whether to support the use of new environment-friendly material packaging, standardization of express packaging and recycling and utilization of packaging, they all believe that it is acceptable and can promote the development of green logistics and green packaging. The improvement of environmental protection awareness will play a very important role in the future packaging reform of China's express industry.



For the development of express packaging, everyone has his own unique ideas. Most online shoppers hope to establish an incentive mechanism to recycle and utilize express packaging, increase investment in science and technology and invent green express packaging. At the same time, it is suggested that the society should strengthen propaganda to promote the establishment of ecological consumption concept, and the government should speed up the legislative norms on the production and use of express packaging.



As it can be seen from figure 4.2, people still have great expectations for green packaging. First, they hope that green materials can be easily recycled. Second, packaging materials are easy to be degraded for post-processing. Third, packaging is relatively safe and harmless. Fourth, I hope the packaging is more stylish and simple texture.

5. COUNTERMEASURES TO PROMOTE THE GREEN DEVELOPMENT OF EXPRESS PACKAGING

Green packaging, mainly refers to the ecological environment and human health harmless, can be reused or recycled, in line with the sustainable development of packaging. The realization of green express packaging, can be improved through the following aspects: packaging materials harmless; standardization of packaging process; packaging waste can be recycled. Only by cooperating with governments, industry associations, express

delivery enterprises, front-line operators of express delivery, e-commerce, packaging material manufacturers and online shoppers can green packaging work be promoted.

5.1 Accelerate the introduction of express packaging policies and regulations

China should actively learn advanced concepts of express packaging policies of developed countries and establish a complete set of laws and regulations. The government should also play a leading role in regulating the operation system of express industry. For example, relevant government departments should issue reward and punishment mechanisms related to packaging and environmental pollution to prohibit the use of harmful substances and the production of toxic substances. Promulgate preferential policies, guide logistics enterprises to establish the concept of "green logistics", "green ecology", "green life" actively, and vigorously advocate the green development of China's logistics enterprises.

5.2 Attach importance to the development of new packaging materials

The development of new materials with recyclability and green environmental protection is extremely urgent. Express packaging material selection should choose green pollution-free, cost-effective new material. At the same time, we should also focus on the packaging of other related configuration materials. Many developed countries in the United States and Europe have made great achievements in the research of outer packaging.

5.3 Standardize packaging operations

Establish relevant laws and regulations to standardize the packaging operation. In recent years, China has attached great importance to the problems of logistics industry. For example, the state administration of quality supervision, inspection and quarantine and other relevant institutions have revised and issued various rules and regulations to restrict the use of express packaging, and put forward the concept of "reduction, greening and recycling" to achieve the rationalization and reduction of packaging.

Express to implement all aspects of classification management and promotion. Implement simple packaging, reduce the utilization rate of packaging, control packaging waste. Using the advantage of intelligent network, the old paper information transportation is upgraded to electronic information transportation. Couriers should strengthen the study of green logistics concept and standardize the disassembly of express delivery in the actual operation process. For paper envelope packaging, it can be easily divided into adhesive packaging, reduce the damage rate of packaging, and achieve the recycling of packaging, but it is necessary to keep relevant personnel information confidential. At present, some express companies have implemented double-sided adhesive compression packaging to increase the reuse rate of envelopes.

5.4 Establish a new concept of green logistics

The 19th CPC national congress report pointed out that the booming development of e-commerce in recent years has brought new problems, and it is urgent to develop green logistics. Through the governance of the "four chaos" of express delivery, the construction of the "four green" and even the "four beauty" of express delivery, green express delivery has become a beautiful landscape in urban and rural areas. Therefore, the government should strengthen the study and promotion of the concept of green logistics, with the goal of green development, encourage logistics enterprises to vigorously promote green logistics, adopt green production technology, use green production materials, and achieve green development of express logistics.

5.5 Establish a packaging waste recovery system

China should speed up the implementation of packaging standardization system of express industry,

implement packaging standardization management, so as to standardize the use of express packaging in the express industry. The government should strongly encourage and cooperate with express delivery companies to implement green packaging , relevant reward and punishment mechanisms, actively build recycling and treatment sites for express packaging, and reach cooperation with express delivery enterprises and packaging waste recycling enterprises to reduce the rate of resource waste and improve the rate of resource recovery, and develop green logistics.

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