

Research on Reusable Express Packaging Design in the Ecological Ethical Perspective

Poyu Zhao^{1,a,*}, Jiankun Duan^{1,b}

¹*Hebei University of Science and Technology, 26 Yuxiang Street, Shijiazhuang, Hebei Province, China*

a. 17702295675@163.com, b. 357485264@qq.com

**corresponding author*

Abstract: With the emergence and development of sustainable concepts, ecological ethics has gradually become a crucial topic in modern art and design. Based on the principles of sustainable development, reusable express packaging is envisioned as the mainstream form of future express packaging, offering a vital avenue for achieving green development in express packaging. This paper explores the issues in the current express packaging domain that contradict green and environmental principles and their underlying causes from the perspective of ecological ethics. It provides principles and methods for the design of reusable express packaging based on ecological ethical viewpoints, employing theoretical analysis and literature review. By optimizing structures and materials, the study aims to promote the green and cyclical development of express packaging, steering express packaging design towards sustainable development.

Keywords: Express packaging, Packaging design, Recycling mode

1. Introduction

The rapid development of the express delivery industry in China, largely fueled by the rise of the e-commerce sector, has significantly contributed to its growth. According to statistics from the National Postal Administration, China's express delivery volume reached 400 billion items in 2017, accounting for 40% of the global market, and increased to 500 billion items in 2018. In 2019, this number exceeded 600 billion, reaching 635.2 billion items, with a year-on-year growth of 25.3%, achieving a cumulative business revenue of 7,497.8 billion yuan [1]. While the express delivery industry has brought substantial economic benefits, it cannot ignore the issues of environmental pollution and resource waste. This paper aims to break new ground by exploring design ideas for reusable express packaging from the perspective of ecological ethics and proposing a feasibility model for the recycling system of express packaging. By addressing existing problems in domestic express packaging, the study presents targeted solutions and strategies, fostering the green and sustainable development of express packaging design. The research contributes to a better understanding of ecological ethics theory, deepening the comprehension of green environmental protection concepts, and laying the groundwork for future theoretical research on sustainable development in express packaging design. In practical terms, the research on reusable express packaging design is beneficial for overcoming current deficiencies in express packaging, promoting the construction of a circular system for express packaging, and advancing the sustainable development of express packaging.

design.

2. Ecological Ethics and Reusable Express Packaging

2.1. Ecological Ethics

Ancient Greece proposed the harmonious unity of the "microcosm" and "macrocosm," believing in their consistent harmony. Similar concepts include China's ancient ideas of "unity of heaven and man" and "harmony between humans and nature." Marx, in addressing this issue, surpassed the awareness of ancient sages, providing a scientific philosophical foundation for the evolution of ecological ethics. Marxism asserts that human transformation of nature leads to contradictions between humans and nature. Therefore, only through practice can a true "harmony" between humans and nature be achieved. The ecological crisis is a global issue for all countries and regions, posing severe challenges to global social development.

In China, it is imperative to establish an ecological ethics concept in line with the requirements of harmonious social development to achieve the harmonious coexistence, interaction, and coordinated development of humans and nature. Whether in economics, politics, ideology, culture, or various aspects of production and life, adherence to ecological ethics is necessary to realize the benign interaction between humans and the natural environment in the new era. Implementing basic principles and moral guidelines of humans and nature on the scale of ecological ethics is crucial for achieving green and sustainable development in various industries.

2.2. Concept and Value of Reusable Express Packaging

Reusable express packaging is a packaging method designed for express delivery and e-commerce online shopping, aiming to reduce packaging waste at the source [2]. In its design, consideration is given to methods and feasibility of circular packaging, focusing on the transformation of packaging functions. It not only reduces waste but also effectively guides consumers to engage in recycling behavior from the source, eliminating resource waste. It represents one of the best manifestations of "zero pollution." The design philosophy of reusable express packaging, from a design perspective, emphasizes resource conservation, efficiency improvement, and the realization of product sustainability. It treats the product as an object with multiple values, breaking away from the traditional concept that solely relies on waste recycling. The integration of environmental issues into various stages of product development minimizes energy consumption throughout the packaging process, maximizing the conversion of resources into products, thereby achieving energy-saving and emission-reduction goals.

3. Current Issues in Express Packaging

3.1. Lack of Environmental Friendliness

The concept of "green development" was first proposed at the 18th National Congress of the Communist Party of China. It comprehensively explained development from economic, environmental, cultural, and social perspectives [3], laying a theoretical foundation for the effective implementation of the green development strategy. Environmental problems in express packaging are mainly attributed to non-environmentally friendly materials and excessive packaging. Common packaging materials include paper bags, cardboard boxes, plastic bags, tape, plastic film, and filling particles. Both express companies and self-produced materials contribute to environmental harm when discarded, causing irreparable damage to soil and water sources. Most external packaging for express delivery is ordinary corrugated boxes, prone to damage during transportation, significantly

reducing the reusability of corrugated boxes. In recent years, rapid development in the express industry has generated a large amount of packaging waste that cannot be recycled, leading to environmental pollution. Complex and extravagant express packaging design and the use of non-degradable, non-recyclable single-use plastics pose challenges not only to the entire society but also to the healthy development of the express packaging industry.

3.2. Lack of a Sound Recycling System

The main obstacle to the development of express delivery enterprises in China is the lack of industry standards, unclear rights and responsibilities, and an ambiguous social division of labor, resulting in wasted resources and low recycling efficiency. Most materials used in express packaging are plastic or corrugated paper. Generally, common plastics cannot undergo secondary processing, and corrugated paper is easily damaged during transit. This makes it difficult to recycle external express packaging when it reaches consumers. Some recyclable cardboard boxes are collected by individual practitioners who sell them to local garbage collection stations or exchange them for new ones. Overall, a comprehensive recycling industry for express packaging has not yet formed in China, and a complete recycling network is lacking. Waste of resources and environmental pollution are due to low recycling rates and frequent use. Moreover, although intelligent technology is prevalent in recyclable packaging, it is not yet universal, and the convenience and speed of the recycling process need further improvement.

3.3. Improvement of Packaging Safety

Buffering is a critical issue in the design of express packaging, but current express packaging cannot meet the buffering requirements. Many express companies, in their packaging processes, do not adequately consider the safety issues during transportation. Inadequate packaging force, unclear packaging labels, and other issues lead to packaging damage and goods being harmed during transportation. To gain a price advantage, some businesses often use low-cost packaging materials, compromising the safety of express packaging. This compromises consumers' awareness and satisfaction with products, impacting the overall efficiency of goods circulation [8].

3.4. Weak Environmental Awareness Among Consumers

Although consumers are the main subjects of express packaging recycling, their current recycling efficiency does not fully recognize its significance. Many consumers perceive express packaging as an additional item belonging to the goods, which they should handle themselves, rather than expecting express couriers to collect [4]. The level of importance consumers place on environmental protection not only affects the efficiency of the entire logistics system but also influences traditional express packaging and waste disposal. Additionally, consumers need to abandon the habit of extravagant waste after using express packaging, as it leads to ecological damage and resource wastage.

4. Principles Guiding Express Packaging Design within the Ecological Ethical Framework

The ecological ethical perspective is a governance philosophy with efficiency, harmony, and sustainability as its goals, embodying a profound understanding of the laws of economic and social development. Implementing ecological ethical concepts in modern express packaging design contributes to achieving harmonious and unified development between humans and nature.

4.1. Principle of Reduction

The concept of "reduction" is central to express packaging design, serving as a key element in

achieving green, ecological, and sustainable development. Packaging materials play a crucial role in promoting green and sustainable development, and the reduction principle involves both physical and chemical reduction of packaging materials to curb excessive packaging. Simultaneously, optimizing packaging structure to reduce packaging volume is essential. Reducing decoration in packaging and conveying environmental concepts to consumers through a simple visual language help minimize ecological and psychological burdens caused by complex decorative elements.

4.2. Principle of Functionality

Functionality primarily refers to the safety of packaging materials and the safety of packaging. Ensuring the reduction of damage to products during transportation, thereby safeguarding product quality, is crucial for assessing the safety of packaging materials and packaging. Secondly, logistics packaging must guarantee product freshness from production to delivery to consumers. Ensuring the functionality of express packaging involves minimizing damage during transportation to reduce circulation costs, safeguard product quality, and enhance user satisfaction.

4.3. Principle of Recyclability

The principle of recyclability is a crucial integration and application of ecological ethical concepts in packaging design. It emphasizes post-use recycling while focusing on the reuse of packaging. Recycling requires materials with sufficient durability and a focus on material reusability. This method is more feasible to promote at express stations, where consumers can easily disassemble packaging, ensuring the operability and relative integrity of recycling. Another aspect involves extending the functionality of packaging, allowing consumers to use packaging for other purposes after its initial use, showcasing one of the essential expressions of the recyclability principle.

5. Methods for Designing Reusable Express Packaging within the Ecological Ethical Perspective

5.1. Environmentalization of Packaging Materials

Environmentalization of packaging materials involves reducing the usage of packaging materials as much as possible while ensuring the basic protective functions of express packaging. This approach aims to achieve recyclable and shared green development in the express industry. Green, environmentally friendly, and recyclable material usage are basic requirements for logistics packaging design. Eliminating non-degradable, non-recyclable disposable materials and incorporating environmentally friendly materials, such as new types of plastics and corrugated paper produced through straw processing, into express packaging design is essential. Investment in technological research and development should be increased to improve and innovate express packaging materials, promoting the application and popularization of green and environmentally friendly bio-based materials and plant fiber materials.

5.2. Innovative Packaging Structure

Express packaging structure, while ensuring basic protective and safety functions, should fully consider consumer user experience and the convenience of recycling. Therefore, considering ecological ethics, packaging structure should avoid functional redundancy and complexity, focusing on achieving shared usage functions to maximize value. On the basis of basic packaging functions, a new practical function should be developed, representing the core innovation of reusable green express packaging. Designers can integrate express packaging with people's daily needs for life and study, transforming express packaging into small items for daily use. For example, unfolding various

structures in the packaging box, consumers can disassemble it according to the instructions during transportation and assemble it into a new product. Currently, some small toys and calendars in the market are packaged this way.

5.3. Emphasizing Standardization of Packaging

Standardization requires industry professionals to classify and categorize various goods, formulate uniform transport rules, reduce excessive packaging, and strengthen the protection of specific goods during transportation. For example, China Post's postal delivery adopts uniform packaging, making packaging for document mail indistinguishable, facilitating delivery, and preventing the loss of express parcels due to size differences. Additionally, uniform packaging sizes are highly conducive to recycling. Standardizing the size of express product packaging, which is often small and flat rectangular space, can be achieved by designing three basic box specifications. Designers can consider three basic sizes: 1) 200mm × 180mm × 170mm; 2) 330mm × 240mm × 165mm; 3) 440mm × 280mm × 160mm.

6. Building a Reusable Express Packaging Recycling Model within the Ecological Ethical Perspective

6.1. Innovating Express Transportation Methods

To enhance the efficiency of express packaging transportation, distribution, and recycling, it is imperative to innovate current express transportation methods to align with the requirements of the new era. This involves establishing a more rational express packaging recycling model. In the context of rapid development in internet technology and 5G, utilizing intelligent transport devices, such as drones, is highly feasible for express transportation. From a long-term perspective, such innovation significantly contributes to cost reduction and efficiency enhancement for express companies and businesses. The application of intelligent devices in transportation not only ensures efficiency, safety, and reliability but also provides great convenience and feasibility for users in recycling and returning packaging. Integrating artificial intelligence devices into the logistics field effectively improves the overall intelligence, convenience, and efficiency of express packaging recycling.

6.2. Establishing Convenient Express Recycling Bins

To facilitate the recycling of express packaging after consumers use it, express companies should place recycling bins near express collection cabinets. This enables consumers to easily unpack and compress the packaging directly into the recycling bin after collecting their parcels. In cases where unpacking is required at home, consumers can return the packaging to the recycling bin after unpacking and retrieving the items. Consumer consumption is the main cause of generating express packaging waste. Therefore, consumers should enhance their environmental protection awareness and embrace the concept of recycling express packaging. Actively cooperating with recycling channels is essential [5].

6.3. Implementing Social Incentive Systems

Governments can play a leading and exemplary role by issuing social incentive regulations. Encouraging enterprises and consumers to adopt a lifestyle centered on green environmental protection can be achieved through corresponding social incentive measures. Incentive measures for enterprises may include tax reductions and interest rate cuts as preferential policies, or the formulation of industry standard regulations, intervening and regulating the market through encouragement and constraints. Additionally, enterprises can establish effective consumer incentive mechanisms.

Encouraging consumer participation through activities such as point-based reductions in express delivery fees or redeeming goods with accumulated points not only enhances consumer involvement but also positively contributes to shaping a favorable corporate image.

7. Conclusion

Achieving genuine green and sustainable development of express packaging is not an immediate accomplishment. From the ecological ethical perspective, the collective participation and efforts of various stakeholders, including the government, enterprises, and consumers, are essential. The practical implementation of principles advocating resource conservation, environmental protection, and a green lifestyle is imperative. Otherwise, even the most well-conceived solutions remain theoretical. For designers, a reusable express packaging design based on ecological ethics should fully consider human care and functionality. Constant innovation, keeping pace with the times, and abandoning complex and cumbersome packaging materials and structures are necessary. Design should focus on developing and using new environmentally friendly materials, ensuring that the design genuinely serves the public. In summary, this paper proposes a feasible plan, but resolving the issue requires the active involvement and collaboration of various sectors in society, emphasizing the urgency of innovating reusable express packaging design and establishing effective recycling models.

References

- [1] State Post Bureau. *The State Post Bureau Announces the Operation of the Postal Industry in 2019* [EB/OL]. (2020-01-14) [2020-02-20]. http://www.spb.gov.cn/xw/dttx_15079/202001/t20200114_2005598.html.
- [2] Ke Shenghai, Yang Zhijun. *Research on Shared Express Packaging Design and Recycling Model* [J]. *Journal of Hunan University of Technology (Social Science Edition)*, 2020, 25(02): 59-64.
- [3] Hu Jintao. *Firmly Advance Along the Path of Socialism with Chinese Characteristics and Strive for the Comprehensive Construction of a Moderately Prosperous Society: Report at the 18th National Congress of the Communist Party of China* [EB/OL]. (2012-11-08) [2020-02-20]. http://www.mj.org.cn/zsjs/wsxy/201211/t20121126_145927.html.
- [4] Yang Yuchun, Chen Yuan. *Research on Express Packaging Based on the Concept of Recyclability* [J]. *Journal of Beijing Institute of Graphic Communication*, 2020, 28(02): 146-150. DOI:10.19461/j.cnki.1004-8626.2020.02.040.
- [5] Du Juanjuan. *On Green Design under the Circulation Economy* [D]. Wuhan Textile University, 2016.