Research on Green Logistics Development in Guangdong Province from the Perspective of Sustainable Development

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Abstract. As the largest province in China's total economy, Guangdong's logistics industry has developed rapidly and has made important contributions to the development of regional economy. In this context, promoting the development of Guangdong's logistics industry to green logistics as soon as possible and reducing carbon emissions are important ways to achieve sustainable development. By analyzing the current situation of the development of the logistics industry in Guangdong Province, this paper finds that there are deficiencies in the information level, transportation structure, and park planning of the logistics industry. Based on the problems found, this paper puts forward some suggestions for the development of green logistics in Guangdong Province.

1. Introduction
Guangdong's logistics industry has developed rapidly, which has greatly promoted economic development. However, with the expansion of logistics scale, it brings a series of problems such as energy consumption, environmental pollution, and urban traffic congestion. The conflict between traditional logistics development mode and sustainable development is becoming more and more obvious. Under this background, Guangdong's logistics industry needs to change its traditional development mode and develop towards green logistics. The construction of green logistics industry in Guangdong Province will be conducive to the realization of sustainable energy conservation and emission reduction, sustainable economic development and the benefit of the whole society and future generations [1].

2. Current Situation of Green Logistics Development in Guangdong Province

2.1. The awareness of green logistics is still not strong enough and the talents of green logistics are insufficient.
In recent years, under the background of building ecological civilization, some large logistics enterprises have begun to practice green logistics management. However, on the whole, the concentration of logistics industry is still not high. Small and medium-sized logistics enterprises mainly stay in the conceptual stage of green logistics management. Driven by the maximization of benefits, they lack specific measures and motivation to carry out green logistics management. At the same time, the whole industry still lacks professional green logistics management talents. In the absence of professional green logistics management personnel, some enterprises that try to carry out green logistics management have made green logistics management into a mere formality due to unscientific and lack of enforceability of the formulated green logistics management plan[2].
2.2. The logistics and transportation structure is not reasonable enough and there is huge space to reduce carbon emissions.

Guangdong Province is located in the coastal area of southern China. It is relatively rainy, with dense river courses and developed water systems. It has inherent advantages in developing waterway transportation. Waterway transportation has the advantages of large transportation volume and low transportation cost, and is especially suitable for bulk goods. However, according to the statistical data released by Guangdong Province in 2019, the proportion of waterway transportation modes in Guangdong Province is not high, which needs to be excavated and the advantages of coastal ports are not fully utilized. From the data in Table 1, it can be seen that 71.58% of the cargo transportation in Guangdong Province is undertaken by high-cost highways, while the relatively low-cost waterway transportation only accounts for 24.29%. Multimodal transport has not yet realized seamless connection, and the waterway transportation capacity has not been fully exploited, thus realizing great potential.

Table 1. Freight Transportation Volume Completed by Various Transportation Methods and Its Growth Rate in 2019.

| Indicators                      | Unit               | Absolute number | Proportion (%) | Increase over the previous year (%) |
|---------------------------------|--------------------|-----------------|----------------|-------------------------------------|
| Total cargo transportation      | Ten thousand tons  | 446050          | 100            | 5.0                                 |
| Railway                        | Ten thousand tons  | 8187            | 1.84           | 7.5                                 |
| Highway                        | Ten thousand tons  | 319279          | 71.58          | 4.8                                 |
| Waterway                       | Ten thousand tons  | 108371          | 24.29          | 5.9                                 |
| Civil aviation                 | Ten thousand tons  | 238             | 0.05           | 5.6                                 |
| Pipeline                       | Ten thousand tons  | 9974            | 2.24           | -0.8                                |

Source: 2019 Guangdong Statistical Development Bulletin

2.3. Logistics park planning is not reasonable enough

Reasonable planning of logistics parks is conducive to optimizing the turnover of logistics transportation, shortening the mileage of logistics transportation and improving the efficiency of logistics transportation. It is of great significance to promote the rapid development of regional economy and reduce carbon emissions. However, the planning of Guangdong's logistics system is still not reasonable enough, which further aggravates the imbalance of regional economic development and is not conducive to the construction of green logistics. According to the data released by the China Federation of Logistics and Purchasing in August 2019, Guangdong has 38 logistics parks above designated size, of which Guangzhou has the largest number, with a total of 18. Shenzhen has 7, Dongguan, Zhongshan and Foshan have 3 each, Zhaoqing, Qingyuan, Meizhou and Shantou have 1 each. As can be seen from Table 2, the number of logistics parks in Guangdong Province is small and unevenly distributed. Over 90% of the logistics parks are distributed in the Pearl River Delta, while only three are located in northeast Guangdong and none in west Guangdong. The layout of logistics parks in Guangdong Province is not reasonable enough, which leads to poor connection of regional logistics and the inability to share logistics resources efficiently. This is not conducive to the improvement of logistics efficiency and hinders the sustainable development of green logistics and economy to a certain extent.

Table 2. Summary of Guangdong Logistics Parks Above Scale.

| Logistics park                          | Cities          | Region              |
|-----------------------------------------|-----------------|---------------------|
| Lin’an Logistics Park                   | Guangzhou city  | Pearl river delta   |
| Fenghe Logistics Park                   | Guangzhou city  | Pearl river delta   |
| Baiyun freight market                   | Guangzhou city  | Pearl river delta   |
| Xindu Logistics Park                    | Guangzhou city  | Pearl river delta   |
| Nanxianggu Intelligent Comprehensive Industrial Park | Guangzhou city  | Pearl river delta   |
| Zhuangyuan Valley Electronic Commerce Industrial Park | Guangzhou city  | Pearl river delta   |
2.4. The informatization level of logistics industry still needs to be improved

In recent years, with the popularization of smart phones and the rapid development of Internet of Things technology, the informatization level of Guangdong's logistics industry has been greatly improved. However, compared with the logistics industry in developed countries, the informatization level of Guangdong's logistics industry still lags behind. The concentration of logistics industry in Guangdong Province is not high enough. There are still many logistics enterprises that still use traditional operation methods, intelligence, and insufficient application of automation equipment. The ability of route optimization and the level of information sharing still need to be improved. In addition, Guangdong's logistics industry has obvious information island phenomenon, lack of necessary public logistics information platform, insufficient integration of information resources in logistics related links, and insufficient smooth cross-regional data exchange. Poor cross-regional information exchange in Guangdong's logistics industry will encourage non-standardized operations, resulting in higher logistics costs and waste of resources, which is not conducive to the sustainable development of green logistics and regional economy[3].
3. Guangdong Province Green Logistics Solution Suggestions

Green logistics is the direction of logistics development in the future, and it is also an important driving force to promote the sustainable development of Guangdong's economy. To develop green logistics, we must solve the current problems of green logistics. Through research and analysis, this paper puts forward the following suggestions:

3.1. Multi-party cooperation to deepen the awareness of green logistics, school-enterprise cooperation to train green logistics personnel

The government, associations, enterprises and schools can cooperate to deepen the awareness of green logistics. Firstly, the government should combine green logistics awareness when introducing logistics policies. It should not only have a macro policy and legal framework, but also have specific resource utilization and reprocessing implementation guidelines or measures to improve the enforceability of policies. Secondly, Logistics associations and logistics enterprises carry out more industry cooperation, regularly exchange successful green logistics management cases, and accelerate the application and promotion of green logistics management in the entire industry. Thirdly, Logistics enterprises cooperate with colleges and universities to train talents through "order class" or modern apprenticeship system, and train green logistics management talents in a customized way, so as to solve the problem of shortage of green logistics talents and promote the promotion of green logistics management[4].

3.2. Promote the construction of "green logistics" system for logistics enterprises

Green logistics is conducive to reducing the cost of logistics and enhancing the competitiveness of enterprises. Green logistics not only reduces the cost of general logistics, but also pays more attention to greening and the resulting energy saving, high efficiency and less pollution. The core idea of green logistics is to realize the coordination between enterprise logistics activities and social and ecological benefits, thus realizing the sustainable development of enterprises. Therefore, in the long run, the interests of enterprises and society are consistent. Logistics enterprises, through modern technology, promote the construction of "green logistics" system, promote the green development of logistics packaging, storage and distribution, promote reusable revolving packaging, strengthen the recycling and reuse of waste packaging, and build a recycling logistics system with low environmental load.

3.3. The government should reasonably plan the layout of logistics facilities

The development of green logistics cannot be separated from the support of hardware infrastructure. Therefore, Guangdong province and local governments should scientifically integrate the scale, layout and functions of logistics infrastructure, and give full play to their effectiveness through renovation and transformation. At the same time, we should continue to expand the scale of investment in logistics infrastructure and accelerate the networking and systematization of modern logistics infrastructure. New infrastructure must be scientifically planned based on the existing infrastructure layout to prevent blind duplication of construction and waste of land resources. In addition, it is necessary to promote the construction of waterways in Guangdong Province, forming a global port development pattern with Guangzhou Port, Shenzhen Port, Zhuhai Port, Shantou Port and Zhanjiang Port as the five major coastal ports, Foshan Port and Zhaoqing Port as the leading inland river ports, radiating south and southwest China, and Guangdong's coastal port cluster with the Pearl River Delta region as the core[5].

3.4. Promote the information management of logistics enterprises

In order to achieve the goal of sustainable development, logistics enterprises need to use advanced management concepts, continuously improve the level of informatization, standardization and automation, promote integration and network management, vigorously develop green logistics, promote energy conservation and emission reduction, and improve the competitiveness and adaptability of enterprises. In the next few years, logistics enterprises will accelerate the integration of "internet plus", Internet of Things technology, big data, cloud computing, unmanned distribution
services and other technologies with the logistics industry to effectively reduce redundant logistics activities and improve the efficiency of green logistics.

4. Conclusions Guangdong Province is the largest province in China's economy

Guangdong Province is the largest province in China's economy. Logistics industry has made great contributions to economic development, but it also poses challenges to the sustainable development of regional economy. Generally speaking, Guangdong's logistics industry can promote the development of green logistics from all aspects and angles from deepening the awareness of green logistics, cultivating green logistics talents through school-enterprise cooperation, building a "green logistics" system, rationally planning the layout of logistics facilities, and promoting the informatization management level of logistics enterprises, thus realizing the long-term goal of sustainable economic development.

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