

Development Strategy and Future Sustainable Improvement Research of China's Aviation Logistics

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Abstract: With the continuous rapid growth of the Chinese economy, aviation logistics has played a crucial role as an important logistics method. However, China's aviation logistics still faces several challenges, including green environmental protection, supply chain efficiency, infrastructure and technological level, regulations and policies, as well as talent reserves and training. This study aims to explore the issues faced by China's aviation logistics and propose corresponding strategies. In terms of green environmental protection, we need to encourage airlines to use more environmentally friendly fuels and promote green technologies to reduce the negative impact on the environment. At the same time, the use of information technology to optimize supply chain management can improve transport efficiency and reliability. In terms of infrastructure and technological level, there is a need to increase investment in the construction of aviation logistics infrastructure and strengthen technological innovation and importation. In addition, it is necessary to gradually improve the regulatory and policy system to enhance the standardization of the industry. Finally, to address the shortage of talent, there is a need to increase the training and introduction of talent in the aviation logistics industry, while establishing a mechanism for industry-university-research cooperation. Through the improvement strategies proposed in this study, we hope to promote the achievement of a greener, more efficient, and sustainable development goal for China's aviation logistics.

Keywords: Aviation Logistics; Green environmental; Protection; Sustainable Improvement

1. Introduction

Aviation logistics, as a fast and efficient transportation mode within the logistics system, plays a crucial role in global trade and supply chain management. With China's integration into the global economic system, its foreign trade volume continues to expand, leading to a sustained growth in demand for aviation logistics. Aviation logistics serves as a bridge and link between China and countries around the world in international trade, holding indispensable importance for China's international economic exchanges and trade activities. Moreover, aviation logistics plays a vital role in addressing emergency situations and time-sensitive cargo transport. Compared to other modes of transportation, air transport offers fast delivery and is suitable for urgent, high-risk, or high-value-added goods ^[1]. This is particularly significant in fields such as urgent medical supplies, high-tech equipment, fresh produce, among others. In particular, during global pandemics, disaster relief, and other emergencies, the rapid transport capabilities of aviation logistics are even more indispensable.

Furthermore, aviation logistics serves as a critical foundation supporting the development of China's manufacturing industry and e-commerce ^[3]. Within the global value chain, aviation logistics efficiently connects producers and consumers, supporting China's product exports and meeting the domestic and international demand for high-quality, fast delivery. In the context of the e-commerce industry, aviation logistics is an essential solution for meeting the pressure of expedited delivery. Overall, as a crucial component of the modern logistics system, China's aviation logistics plays a significant supporting role in global trade connectivity and the

internationalization and modernization development of the Chinese economy^[2]. The development of aviation logistics is of vital importance in enhancing China's logistics efficiency, promoting global interconnectivity in trade and production, and elevating China's position in the global value chain^[5].

The aviation logistics service chain, as a complex network system, is centered on meeting customer needs. It begins with the origin of goods and then progresses through various transportation modes, storage and distribution processing services, airport cargo handling services, and air transport services, ultimately delivering goods to the specified location of the end user. The entire process presents a chain-like and networked relationship. Through this chain-like and networked relationship, the aviation logistics service chain achieves efficient flow of goods and the circulation of information, business, and funds between various service entities and operational processes. As global trade continues to expand and the complexity of supply chains increases, the aviation logistics industry's position in the global economy becomes even more crucial^[4-6]. Air transport, with its notable advantages such as speed, efficiency, and global coverage, has become an indispensable part of the global supply chain. Over the past few decades, the aviation logistics industry has undergone significant transformation. Each service stage corresponds to different management and operational models, transitioning from traditional cargo transport to more intelligent, digitalized, and sustainable operational models.

2. Status of China's aviation logistics development

During the period from 2020 to 2022, the Chinese aviation transport sector experienced a significant business crisis as a result of the pandemic's impact. Nevertheless, due to the implementation of optimized epidemic prevention measures and the gradual economic recovery, there has been a continuous rise in the public's travel demand, leading to an overall improvement in the operational conditions of the Chinese aviation transport industry. On October 27th, the Civil Aviation Administration of China conducted its routine monthly press conference, where they reported that the total flying time for air transport in the third quarter of this year amounted to 3.409 million hours. This represents a 73.4% increase compared to the previous year and a 7.1% increase compared to the same period in 2019. Additionally, the cumulative number of flights reached 1.373 million, indicating a 65.7% year-on-year increase and a 5.5% rise compared to the same period in 2019. Furthermore, general aviation witnessed a year-on-year increase of 7.0% in accumulated flight time, reaching a total of 396,000 hours. Moreover, there was a remarkable surge of 35.2% compared to the same period in 2019. These statistics reflect a trend of a safe and organized recovery within the civil aviation sector. As of the end of October 2023, the cargo aircraft fleet within the industry has enlarged to include 254 aircraft, signifying a growth of 31 aircraft since 2022 and 81 aircraft since 2019. Approximately 31 million tons is the designated annual capacity for handling cargo in airport facilities, with an estimated utilization rate of approximately 80% for international terminal facilities. Regarding the arrangement of the aviation logistics network, domestically, a primary air transport pathway for cargo has been created, primarily encompassing four world-class airport clusters, namely Beijing-Tianjin-Hebei, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, and the Chengdu-Chongqing region. On an international scale, China has established bilateral agreements for air transportation with 129 countries and regions, leading to the establishment of different levels of arrangements for "3rd, 4th, and 5th freedom traffic rights." Internationally, there are a total of 336 air routes, and Chinese cargo airlines operate to serve 61 foreign countries while connecting to 142 foreign airports, thus actively contributing to the development of the "Belt and Road" initiative in collaboration with 42 nations.

3. Problems in China's aviation logistics development

While China's aviation logistics development has made great achievements, it also faces some problems and challenges. The following discusses the problems of China's aviation logistics development from various aspects.

3.1 Green Environmental Protection

Although air transport has significant advantages such as high speed, high efficiency and global coverage, its impact on the environment is also a growing concern. Carbon emissions from aviation continue to increase and are one of the main causes of global warming and climate change. In China, as economic and trade activities continue to grow, the demand for air cargo continues to

increase, with an increasingly significant impact on the environment. Although air cargo accounts for a small percentage of the total, every tonne of cargo transported puts a greater strain on the environment. Therefore, how to effectively reduce the environmental impact of air transport in the development of China's air logistics and achieve a greener and more sustainable development is an urgent issue that needs to be addressed.

3.2 Supply chain efficiency and reliability

Supply chain efficiency and reliability in China's air logistics is another concern. Because air cargo is fast, long-distance, and usually used for high-value and urgently needed trade commodities, there is a high demand for supply chain efficiency and reliability. However, the supply chain efficiency and reliability of China's air logistics is not always as efficient and reliable as it should be due to the many transport links, poor information exchange, and complex policies and regulations. In particular, there are still many problems in cargo transshipment, transport tracking and security.

3.3 Infrastructure and technology level

China's aviation logistics infrastructure and technology level is relatively lagging behind, with insufficient support for air cargo. Air logistics requires advanced aircraft, warehousing, sorting, tracking systems and other facilities to ensure the smooth lifting of cargo. However, China's current level of air cargo infrastructure and technology in some regions still lags behind that of developed countries. In addition, technological upgrading and innovation are crucial to improving the efficiency and safety of air logistics operations, as well as energy conservation and emission reduction.

3.4 Regulations and policies

Aviation logistics involves a variety of fields, such as aviation, cargo, customs, quality inspection, etc. The unification, coordination and implementation of various regulations, policies and standards is an important guarantee for the development of the aviation logistics industry. At the same time, policies on import and export tariffs of air cargo, regulatory agencies, security and other aspects also play a key role in the development of aviation logistics. During the development of China's aviation logistics, it is necessary to gradually improve the system of regulations and policies, unify rules and standards, and enhance the competitiveness of the aviation logistics market.

3.5 Talent Reserve and Cultivation

Modern aviation logistics requires high-quality management talents and technicians, who need to have a global perspective, industry expertise and scientific innovation ability. However, there is currently a shortage of aviation logistics management talents in China, and the industry's demand for high-quality talents is increasing. Therefore, China's aviation logistics needs to increase the cultivation and introduction of talents to meet the current and future development needs in the fields of logistics planning, management innovation, and technology research and development in aviation logistics.

4. Policy recommendations

To solve the problems facing China's aviation logistics development, it is necessary to integrate improvement measures in various aspects, covering government policies, enterprise management, technological innovation, personnel training and other aspects.

Firstly, with regard to greening, in order to reduce the environmental impact of air transport, China's aviation logistics needs to widely promote green initiatives. The government can increase its efforts to formulate environmental protection policies, raise requirements for limiting pollutant emissions, and encourage airlines to use green fuels and promote the application of renewable energy in air transport. In addition, aviation logistics enterprises need to strengthen their own environmental awareness, actively renovate existing means of transport and facilities, implement green logistics concepts, reduce energy consumption and reduce carbon emissions.

Second, supply chain efficiency and reliability. To address the problems of supply chain efficiency and reliability in China's aviation logistics, enterprises can optimize the logistics management system with the help of information technology to achieve rapid transportation of goods and full visual monitoring. At the same time, they can strengthen communication and cooperation with

relevant departments to improve the level of cargo transshipment, transport tracking and security, and ensure the safety and timeliness of cargo in the whole transport process. Government departments can provide more policy support to encourage enterprises to invest in logistics optimisation to improve transport efficiency and reliability.

Thirdly, with regard to the level of infrastructure and technology, the Government can increase its investment in the construction of aviation logistics infrastructure and improve the modernisation of airports and warehousing facilities. At the same time, enterprises are encouraged to increase their investment in research and development and technological innovation, and to introduce advanced aircraft, air cargo equipment and logistics management technology. Upgrading the level of technology, accelerating the renewal of aviation logistics facilities and equipment, and promoting the development of aviation logistics in the direction of intelligence, digitalisation and sustainability.

Fourthly, with regard to regulations and policies, the Government can strengthen the supervision and regulation of the air logistics market and promote a level playing field in the air cargo market. It should establish a sound regulatory mechanism and standard system for air logistics, and unify various types of regulations and policies to promote the healthy and orderly development of the industry. At the same time, aviation logistics enterprises are encouraged to work more closely with airlines, transport companies and related industries to develop sustainable logistics solutions, optimize the aviation logistics and transport network and promote the synergistic development of the entire industry chain.

Finally, regarding the talent pool and training, in order to solve the problem of shortage of talents in aviation logistics, it is necessary for the government, colleges and universities, industry organisations and enterprises to make joint efforts. The government can increase the training and introduction of talents in the aviation logistics industry and provide more policy support and financial support for talents. Aviation logistics enterprises can increase the investment in talent training for new technologies and new modes, and introduce and cultivate more professionals with knowledge background of sustainable logistics management.

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