Study on Logistics Cost of Timber Transportation—A Case Study of Jingnan Town, Xingyi City

Weiqi Yan*
Zhejiang Wanli University, Ningbo 315100, China. E-mail: 17857158615@163.com

Abstract: Transportation logistics of wood is one of the important links of wood processing industry, and its high efficiency and low cost directly affect the survival of enterprises. Timber transportation and inventory are the two most important parts of its logistics cost. Based on the field investigation of Jingnan Town Processing Park and the analysis of its geographical location and existing industrial scale, this paper puts forward three constructive suggestions: use the combination of multimodal transportation and land and water transportation to reduce transportation costs, integrate transportation resources through third-party logistics outsourcing, and use material demand planning to optimize inventory.

Keywords: Jingnan Town; Timber Transport; Logistics Cost

1. Introduction

China is not only the world’s largest wood processing and wood product production base and the most important wood product processing exporter, but also one of the largest wood buyers in the world. With the renewal of production technology, the gradual formation of specialized production and the improvement of management level, China’s wood processing industry has achieved rapid development. With the rapid and stable development of China’s economic construction and the improvement of residents’ quality of life, the demand for wood processing products will continue to increase. Under this background, in order to promote the industrialization and cluster development of wood processing, Xingyi City, Guizhou Province decided to build a wood processing park in Jingnan Town, Xingyi City.

2. Advantages of timber transport logistics development

2.1 Jingnan Town logistics location analysis

2.1.1 Geographical location

Xingyi City is located in the junction of the three provinces of Guizhou, Yunnan and Guangxi. It is an important power production center, power intersection center and two important hubs connecting the southwest and South China power grids. It is also an important business town and material distribution center of the junction of Guizhou, Yunnan and Guangxi.

The overall planning area of the first phase of the park is 2354.47 acres. It is located in the northwest of Jingnan Town, Xingyi City, next to the Xingluo Expressway. It is 17 kilometers away from the main living area of Xingyi City, 20 kilometers away from Xingyi Airport, and 31 kilometers away from the railway station. The transportation is con-
2.1.2 Transportation infrastructure

From the perspective of inter-provincial transportation, the Nanning-Kunming Railway connecting Nanning, Guangxi and Kunming, Yunnan, Dingxing-Guanxing high-grade highway, 324 National Highway, and Xingyi Wanfenglin Airport provide hardware guarantee for the park’s products to be sold nationwide.

From the urban and rural point of view, the Xingyi Municipal Committee and the municipal government invested 950 million yuan in 2016 to carry out the reconstruction and extension of the Xingyi Expressway, connecting Xingyi to Jingnan Town. After completion, it will greatly shorten the travel time of the township and urban areas in the south of Xingyi.

From the perspective of road hardening in the park, Jingnan Town Timber Industrial Park has completed 409.6167 mu of land acquisition and compensation. The first phase of the main road foundation excavation and the laying of the optimal layer have basically been completed, ensuring the normal passage of large-scale timber transportation vehicles.

2.2 The construction of timber industry has reached a scale

The completion of the wood processing park in Jingnan Town has consolidated the foundation for industrial development and improved its carrier function. The wood processing park makes full use of the benefits of agglomeration and scale. Intensive development has greatly reduced the transportation cost of products. During the normal production and operation period, the average annual operating income is 200 million yuan, and the initial results have brought great confidence to investors. If the park is fully completed, it is expected to accommodate more than 350 companies, with an annual output value of 8.6 billion yuan and annual tax revenue of about 1.2 billion yuan. The expansion of production capacity means the expansion of logistics transportation demand, and the formation of scale effect helps to further reduce logistics transportation costs.

2.3 Close to the origin of raw materials

Xingyi City is rich in woodland resources. The city’s forest area is 1.965 million mu, and the forest coverage rate is 45%. The passage provides the main guarantee for the timber supply in the processing park. In order to solve the problem of difficult timber transportation, in the early stage of the construction of the industrial park, the layout of the transportation trunk line connecting the production area-the factory-the customer was started, which shortened the transportation mileage and saved the transportation cost while ensuring the transportation capacity.

3. Problems existing in the development of timber transport logistics

3.1 Low logistics and transport efficiency

Due to the continuous expansion of the production capacity of processing plants and the continuous expansion of demand for wood, in order to ensure the safe inventory of wood, processing plants have dispersed their dependence on a single supplier. The increase in the number of suppliers means that the timber transportation process is complicated and fragmented, resulting in inefficient logistics and transportation. In view of the fact that timber, as a bulk commodity, requires large transportation capacity, the empty return rate of transportation vehicles is high, and the transportation cost of timber remains high. In addition, wood, as a bulk commodity, has a high demand on transport capacity, which leads to high air return rate of transport vehicles and high transport cost of wood.

3.2 High warehousing costs

As a renewable natural forest resource, timber supply has a significant seasonal distribution due to various restrictions such as forest growth cycle and natural destruction caused by deforestation. In view of this characteristic, as an important means to alleviate the contradiction between production and marketing, the park has established open and semi-open simple storage space. Since wood is a commodity, the land area occupied by storage and a large amount of
capital have always been a problem affecting the healthy operation of the cash flow in the park.

3.3 Low degree of logistics information network

Currently, the main business contacts between the park and the timber suppliers rely on traditional telephone communication. Due to the backward information management technology and the low penetration rate of modern science and technology, the information on the supply and demand sides of raw materials does not match, which will affect the accuracy of supply and demand information, the timeliness and accuracy of logistics, and the level of logistics services. The low degree of informatization of supply chain logistics has led to an increase in transaction costs.

4. Suggestions on reducing the cost of wood transportation and logistics in Jingnan Town

4.1 Combination of land and water transport

As an important part of comprehensive transportation system and comprehensive utilization of water resources, inland water transport is an important strategic resource to realize sustainable economic and social development. It has the characteristics of large transport capacity, less land use, low energy consumption and low pollution, and plays an important role in the implementation of sustainable development strategy and green ecological construction. European and American countries have always attached great importance to the development of inland waterway transport, taking inland waterway transport as an important part of national transportation infrastructure, and providing policy and financial guarantee[5]. Nanpanjiang Estuary has an average annual flow of 688 cubic meters per second and a drop of 425 meters, providing suitable navigable conditions for inland rivers[6]. Because water transportation has large capacity and low transportation cost, and the Nanpan River has suitable navigation conditions, it can be analyzed in combination with the location of the main wood supply area. Relying on the Nanpan River water system, build wharves along the river in the timber supply area, and adopt a multimodal transportation method that combines water and land transportation to reduce the cost of long-distance transportation[7].

4.2 Third party logistics outsourcing

The third party logistics enterprises can complete logistics activities for the wood supply chain and provide convenience for the purchase and sale activities between the wood producers and consumers. 3PL enterprises are characterized by the collection, organization and distribution of scattered timber sources to their downstream wood users. The activity scope and market coverage of third-party logistics enterprises are huge, and its role cannot be ignored[8]. Third party logistics enterprises have a wide range of business links, which can directly connect timber suppliers with the needs of the park, reduce the number of frequent transactions between many buyers and sellers, and improve the turnover rate of timber. Especially after the country implemented the reform of the forest tenure system, the role that third-party logistics companies can play has become more and more prominent. Third-party logistics companies integrate scattered timber suppliers to form an intensive effect of resources, which not only reduces the number of transactions in the supply chain, but also reduces transaction costs[9].

4.3 Supply and demand enterprises jointly manage inventory

In view of the current status of independent procurement and independent inventory of wood processing plants, in order to avoid the “bullwhip effect” in the wood supply chain[8], wood processing plants can adopt material demand planning (MRP). The timber processing plant achieves the coordination and close operation of production, supply and marketing through a strategic alliance with timber suppliers. In the traditional way of timber procurement, the procurement department of the park will carry out a large amount of inventory after the timber procurement, as a production reserve, to meet the production needs of enterprises. In addition, supply, demand and inventory information are all trade secrets of each company and are generally not disclosed. Therefore, in order to protect their own interests, they can only deal with market changes with a large amount of inventory, which increases the inventory cost of the supply
chain. Only when all enterprises in the supply chain realize the transparency of supply and demand information, can they ensure the punctuality and high level of logistics services, and avoid the occurrence of blind production and a large number of inventory phenomena. To a great extent, this can alleviate the increasingly serious inventory backlog problem and reduce the logistics costs of enterprises.[10]

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