

# Analysis on the Construction of Comprehensive Grain Logistics Park in LY City of Hunan Province

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**Abstract**—In order to promote the development of local grain industry, LY City, Hunan Province, plans to build a comprehensive grain logistics park. This paper analyzes the total logistics market and its development space, demand environment of logistics market, and need of logistics service modes, to provide reference suggestions for project construction.

**Keywords**—logistics park; construction; market analysis

## I. INTRODUCTION

Grain logistics connects with production and consumption, which is conducive to maintaining the basic balance of grain market. However, in general, Chinese grain logistics still stays at the traditional level. The lagging construction of Chinese grain logistics system has become a major obstacle to restrict grain circulation. The contradiction between the objective requirement and the actual situation of grain logistics development has become the main one in the development of grain circulation in China. To promote the development of the local grain logistics industry, LY City, Hunan Province, plans to build a comprehensive grain logistics park in LY City.

## II. ANALYSIS OF TOTAL LOGISTICS MARKET AND ITS DEVELOPMENT SPACE IN LY CITY

### A. Estimation of Total Logistics Market in LY City

LY City achieved a total output value of RMB 17.6 billion, an increase of 14.8%, calculated at comparable prices, over the previous year. The added value of primary industry, secondary industry and tertiary industry was respectively RMB 2.805 billion, 9.888 billion and 4.522 billion, an increase of 6.9%, 20.5% and 11.5% respectively over the previous year. The contribution rate of the three industries to economic growth was respectively 8.87%, 63.9% and 27.23%, which boosted GDP growth by 1.31 percentage points, 9.46 percentage points and 4.03 percentage points respectively. The ratio of the three industrial structures was 16.3: 57.4: 26.3.

According to China's total social logistics expenditure accounting for about 18% of GDP, LY City's total social logistics expenditures reach over RMB 3 billion. This huge total market will become a "big cake" competitively carved

up by logistics enterprises in LY City. It can be believed that many logistics enterprises will hopefully share this "big cake of total market".

### B. Analysis of Logistics Market Development Space in LY City

The output value of the social logistics industry in developed countries accounted for about 11% of GDP on average in 1991, and the total social logistics expenditures in America were less than 10% of GDP. Therefore, based on the GDP level of that year, in case of reaching the same level, LY City will be able to save more than RMB 300 million of logistics costs for the whole society, or in other words, generate more than RMB 300 million of profits. The huge decreased value in social logistics costs brought by the development from traditional logistics to modern logistics is just another "big cake" for logistics enterprises to share in competition. Merely compared with the "big cake of total market", the "big cake of market space" puts more emphasis on the competitive strength of logistics enterprises.

Assuming that China has made great progress in its economic development in the next five years, with rapid and efficient logistics development and logistics costs accounting for 15% of GDP, the development space of logistics market is about RMB 700 million in LY City.

## III. ANALYSIS OF THE DEMAND ENVIRONMENT OF LOGISTICS MARKET IN LY CITY

At present, the demand of logistics market in LY City mainly comes from the following aspects:

### A. Large Logistics Demand Volume of Agricultural and Sideline Products in LY City

Currently, LY City has the characteristics of continuously fast growth of agricultural economy, steady development of production, gradual progress in industrialization, further optimization of industrial structure in agriculture, and has initially formed a featured and high-efficiency agriculture dominated by high quality rice industry belt, flowers and trees industry belt, flue-cured tobacco industry belt, and vegetable

industry belt. The total value of output of agriculture, forestry, animal husbandry and fishery reach RMB 4.51 billion, an increase of 7.3% over the previous year, of which the agricultural output value is RMB 2.229 billion, an increase of 7.7%, and the forestry output value is RMB 407 million, an increase of 6.4%, and the animal husbandry output value is RMB 1.648 billion, an increase of 7.5%, and the fishery output value is RMB 152 million, an increase of 1.9%, and the output value of agriculture, forestry, animal husbandry and fishery services is RMB 74 million, an increase of 9.1%. Agricultural and sideline products grew by 10.15% annually in 2014 and 2015 in LY City, with over 1.5 million tons of agricultural and sideline products gestating a huge logistics demand. This paper takes grain of LY City as an example to analyze the logistics demand of agricultural and sideline products.

As the grain is the staple food of the people in LY City, farmer producing and marketing their own products accounts for a large proportion, but the total logistics volume is still relatively large. The proportion of circulation volume of other products, such as cotton, rapeseed, flue-cured tobacco, herbs, and aquatic products, will be much higher than that of grain, at least more than 80%. The proportion of vegetables, meat and aquatic products that are consumed in local areas is relatively large, and the proportion of circulation volume of logistics services required by them is conservatively estimated to be 10%. According to this proportion, we can roughly calculate the logistics demand of grain and agricultural products in LY City at the present stage in "Table I":

TABLE I. ESTIMATION OF AGRICULTURAL AND SIDELINE LOGISTICS DEMAND IN LY CITY IN 2015 (TON)

	Total Output in 2015	Proportion of Logistics Demand Volume	Estimation of Logistics Demand Volume
Total grain output	567641	3%	17029.23
Cotton	561	80%	448.8
Rapeseed	7112	80%	5689.6
Flue-cured tobacco	16506	80%	13204.8
Ramie	554	80%	443.2
Fruit	98288	80%	78630.4
Tea	1536	80%	1228.8
Vegetable	648078	10%	64807.8
Medicinal material	13205	80%	10564
Total meat output	139139	10%	13913.9
Total output of aquatic products	22000	20%	4400
Subtotal	1514620	-----	210360.53

If the average annual growth rate is 5%, the logistics demand volume of grain and agricultural and sideline products in 2020 and 2025 can be calculated as the following "Table II":

TABLE II. FORECAST OF LOGISTICS DEMAND VOLUME OF AGRICULTURAL AND SIDELINE PRODUCTS IN LY CITY IN 2020-2025 (TON)

	Total output in 2015	Proportion of logistics demand volume	Estimation of logistics demand volume	Predicted volume in 2020	Predicated volume in 2025
Total grain output	567641	15%	85146.15	108670.46	138694.11
Cotton	561	80%	448.8	572.80	731.05
Rapeseed	7112	80%	5689.6	7261.53	9267.76
Flue-cured tobacco	16506	80%	13204.8	16853.04	21509.23
Ramie	554	80%	443.2	565.65	721.93
Fruit	98288	80%	78630.4	100354.53	128080.64
Tea	1536	80%	1228.8	1568.29	2001.59
Vegetable	648078	10%	64807.8	82713.00	105565.08
Medicinal material	13205	80%	10564	13482.64	17207.64
Total meat output	139139	10%	13913.9	17758.05	22664.28
Total output of aquatic products	22000	20%	4400	5615.64	7167.14
Subtotal	1514620		210360.53	355415.64	453610.42

### B. The Relatively Large Scale of Logistics Demand of Industrial Products

In 2015, the total industrial output value of LY City reached RMB 20.995 billion, an increase of 31.4% over the previous year, and the added value reached RMB 7.552 billion, an increase of 22.1%. There were 499 large-scale industrial enterprises and the output value reached RMB 9.098 billion, an increase of 53.27%, accounting for 43.3% of the total industrial output value. The increased contribution rate for the whole industry reached 63.1%.

The main industrial product categories and recent output of LY City considered in this project are shown in "Table III":

TABLE III. OUTPUT OF INDUSTRIAL PRODUCTS CONSIDERED IN THIS PROJECT IN LY CITY IN 2013-2015 (TON)

Categories	Unit	In 2013	In 2014	In 2015
Nitrogenous fertilizer	Ton	12783	13619	13140
Raw coal	Ton	315600	369567	351816
Fodder	Ton	64636	176901	192614
Cement	Ton	447200	434718	400601
Subtotal	Ton	840219	994805	958171

The output of industrial products considered in the project of LY City grew by 7% annually in 2014 and 2015, with an annual average of more than 930 thousand tons of industrial products generating huge logistics demand. Industrial products are different from agricultural and sideline products: if industrial products are produced, there will be a series of logistics demands such as procurement, storage and production logistics of raw material, and storage, transportation and distribution of finished products. Therefore, we can regard its output directly as logistics demand volume. According to its growth rate in recent years (estimated at 5% per year), we can calculate the logistics demand of industrial products at the present stage in LY City in 2020-2025 in "Table IV".

**TABLE IV. PREDICATED LOGISTICS DEMAND VOLUME OF INDUSTRIAL PRODUCTS IN THIS PROJECT OF LY CITY IN 2010-2015**

Categories	In 2015	In 2020	In 2025
Nitrogenous fertilizer	13140	16770.33973	21403.6754
Raw coal	351816	449016.2742	573071.192
Fodder	192614	245829.6969	313747.9096
Cement	400601	511279.6702	652536.8164
Subtotal	958171	1222895.981	1560759.593

### C. The Stable and Slightly Declining Logistics Demand of Agricultural Material Consumption

LY City has an area of 941,400 mu of cultivated land, and there is a large logistics demand of agricultural material consumption products. The amount of consumption of major agricultural products in LY City in 2013-2015 is shown in "Table V":

**TABLE V. AMOUNT OF CONSUMPTION OF AGRICULTURAL MATERIAL PRODUCTS IN LY CITY IN 2013-2015**

Categories	Unit	In 2013	In 2014	In 2015
Nitrogenous fertilizer	Ton	53500	51100	46400
Phosphatic fertilizer	Ton	29700	31700	30100
Potash fertilizer	Ton	13300	15200	13900
Compound fertilizer	Ton	31400	33000	32500
Use of agricultural film	Ton	1266	1122	1364
Subtotal	Ton	129166	132122	124264

The average annual growth rate of agricultural material products in LY City in 2014 and 2015 was -1.83%, and the agricultural material products with an annual consumption of more than 120 thousand tons had a huge logistics demand. Agricultural material products are generally not produced by farmers themselves, so there must be a series of logistics demands such as storage, transportation and distribution of agricultural material products. Therefore, we can regard its amount of consumption directly as logistics demand volume. According to its growth rate in recent years (estimated at -2% per year), we can calculate the logistics demand of agricultural products in LY City in 2020-2025 in "Table VI".

**TABLE VI. PREDICATED LOGISTICS DEMAND VOLUME OF AGRICULTURAL MATERIAL PRODUCTS IN LY CITY IN 2020-2025**

Categories	Unit	In 2015	In 2020	In 2025
Nitrogenous fertilizer	Ton	46400	41941.92	37912.178
Phosphatic fertilizer	Ton	30100	27208.02	24593.891
Potash fertilizer	Ton	13900	12564.50	11357.312
Compound fertilizer	Ton	32500	29377.43	26554.866
Use of agricultural film	Ton	1364	1232.95	1114.4873
Subtotal	Ton	124264	112324.81	101532.74

### D. The Rapidly Increased Logistics Demand of Residents' Living Consumption in LY City

The status of per capita living consumption expenditure of residents in LY City in 2013-2015 is shown in "Table VII":

**TABLE VII. PER CAPITA LIVING CONSUMPTION EXPENDITURE OF RESIDENTS IN LY CITY IN 2013-2015**

Categories	Unit	In 2013	In 2014	In 2015
Food	Yuan	1481	1647	1776
Clothing	Yuan	180	177	279
Residence	Yuan	540	526	728
Household equipment and supplies	Yuan	114	160	146
Health care	Yuan	159	235	257
Traffic communication	Yuan	287	321	409
Culture, education and amusement	Yuan	429	434	408
Subtotal	Yuan	3190	3500	4003

The per capita living consumption expenditure of residents in LY City annually increased by 12% in 2014 and 2015. With a population of 1,345,410, LY City has a consumption demand of more than RMB 5.3 billion, and the agricultural material products with an annual consumption of over 120 thousand tons had a huge logistics demand. After statistical analysis, it is found that logistics expenses generally account for about 2.4% of consumer goods sales amount. According to this proportion, the logistics demand value of residents' living consumption in LY City in 2020-2025 can be roughly estimated in "Table VIII".

**TABLE VIII. PREDICATED RESIDENTS' LIVING CONSUMPTION LOGISTICS DEMAND IN LY CITY IN 2010-2015**

Categories	Unit	In 2015	In 2020	In 2025
Residents' consumption logistics demand	Yuan	129256230	208168451	335257372

## IV. ANALYSIS AND PREDICTION OF DEMAND OF LOGISTICS SERVICE MODES

In order to accurately grasp the current and future logistics service modes in LY City, we have conducted a three-day survey on the three largest professional markets in LY City. We have distributed 62 questionnaires and collected 56 valid questionnaires, accounting for 90% of the total content.

Through the analysis of 56 valid questionnaires obtained from the above three markets, we have a more comprehensive understanding of several major commercial and wholesale markets and their logistics demands in LY City. The main non-agricultural consumer goods in LY City are basically supplied by the area outside the city. The supply from Hunan Province accounts for 46.7%, of which the supply from Changsha, Zhuzhou and Xiangtan accounts for 26.7%, and the supply from other provinces accounts for 50%. In the transportation of these foreign consumer goods, 50% of them are transported by manufacturers or superior agents, and 29% of them are transported by the third-party, and 9% of the merchants adopt composite transportation. At present, the method of bulk procurement is still a procurement method used mostly by merchants, accounting for 68.9%, and a large number of warehouses outside the shop front are needed. From the survey results in the fourth and seventh questions, we can also see that 54.8% of the merchants need warehouse to store goods, and the average monthly sales of most merchants remain in small to medium batches. At the same time, we learn through the visit that the current storage conditions and management level of these warehouses are poor and almost belong to zero management, and most of

them are concentrated around the market. These facts show that logistics level in LY City is in a primary stage, but also indicate that enterprises taking third-party logistics as a main form in LY City have a large development space, which can provide large-scale parking lot for the logistics center of storage type.

Second, the sales target of these wholesale markets is mainly for the LY city area, and the radiation capacity is small. The goods delivery takes their own vehicles as the main means or is responsible by the seller, but the ability of third-party freight also cannot be ignored. Most of the powerful enterprises have their professional distribution teams, while distribution vehicles for individuals and small businesses are simple. They generally use tricycles, which are time-consuming and laborious. The single delivery capacity is small, and the scope is basically limited to urban distribution.

Third, most merchants do not have high requirements for logistics services, and 90% of them are basically satisfied with the current logistics services. Most people regard logistics as transportation, and it can be seen from the results of the survey on the causes of dissatisfaction, they do not understand the value-added services of logistics. In the choice between service and cost, which are two factors with antinomy, most of them tend to choose the cost, which may be related to the small scale of the merchant. Therefore, in the construction of this project, the public opinion publicity at the early stage should be strengthened to enhance people's understanding of logistics, and the invested cost should be controlled well, and the facilities can be properly and rationally.

## V. CONCLUSION

Based on the analysis and forecast of total logistics market and development space, demand environment of logistics market, and need of logistics service modes in LY City, it can be preliminarily concluded that the comprehensive grain logistics park in LY City of Hunan has a good construction foundation, and the construction of the project will vigorously promote the development of regional grain logistics industry.

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