



Research Paper

Research on the construction of collaborative development model of rural e-commerce and logistics in Panzhihua in the post-epidemic era

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Abstract: This article analyzes the current situation and problems faced by the coordinated development of rural e-commerce and rural logistics in Panzhihua in the post-epidemic era, including the sales of agricultural products by farmers, farmers' understanding or degree of cooperation with e-commerce logistics, incomplete logistics management systems, and low logistics efficiency, lack of logistics personnel, lack of logistics technology, etc. Combined with the development of rural e-commerce and logistics in Panzhihua in the post-epidemic era, a series of solutions are proposed on this basis: strengthening farmers' understanding of e-commerce logistics in various regions, using online platforms to promote local sales, and improving the technical level of logistics personnel. Provide professional training, establish a sound system, and promote the coordinated development of e-commerce and logistics.

Keywords: post-epidemic era; rural e-commerce; logistics; coordinated development

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I. Introduction

In recent years, the development speed of my country's traditional foreign trade has slowed down, and cross-border e-commerce has risen rapidly, with broad development prospects. According to data predictions published by relevant departments, the ultimate scale of cross-border e-commerce will account for more than 30% of global trade in goods, and the impact of the epidemic has accelerated the development of cross-border e-commerce[1]. As my country's epidemic prevention and control work has transitioned from an emergency state to a regular one, the country's focus on rural areas has returned to revitalizing rural areas and agricultural issues. Although our country has successfully achieved an overall victory in the fight against poverty and solved the problem of absolute poverty in rural areas of our country, there is still a certain distance from achieving common prosperity [2]. In the post-epidemic era, studying the construction of a coordinated development model of rural e-commerce and logistics in Panzhihua is a key strategy to help the overall development of rural areas.

At present, Panzhihua City has logistics companies in Zongfa Township, Jinjiang Town, and Yumen Town of Renhe District, and rural e-commerce in these areas has developed to a certain extent during the three-year epidemic period from 2020 to 2022. When the epidemic is released in 2023, Panzhihua will also enter the post-epidemic era. However, with the changes in the trade environment, rural e-commerce and logistics faced problems in the early development process, such as small scale, low level, small scope, over-dispersion, and lack of overall planning. Problems such as coordination gradually emerged. There are still many problems in the coordinated development of rural e-commerce and logistics. It cannot be applied well in practice, let alone play its full role. A complete system is needed to strengthen and improve relevant measures.

1 Current situation and problems faced by rural agricultural products

Surveys and studies have shown that, with the increasing use of technology in agriculture, the low educational level of rural farmers and limited transportation options have led to high production costs for crops such as vegetables and fruits in various regions. Unfortunately, the selling price for these products remains low, resulting in an oversupply of agricultural products. This oversupply often leads to a backlog of unsold products, which can ultimately lead to spoilage. This is a common occurrence in many areas. After field investigation, farmers in Panzhihua know little about local e-commerce and logistics. 85% operate their own stalls and are very dissatisfied with their sales and income. Only a very small number of young farmers can make good use of e-commerce platforms to sell agricultural products. This article sorts out the current status of rural e-commerce

and logistics in Panzhihua and the problems it faces. From the analysis of the collected data, the following conclusions were drawn:

1.1 The sale channels for agricultural products are exceedingly narrow, leading to a severe accumulation of produce.

Figure 1.1: Agricultural Product Sales Channels

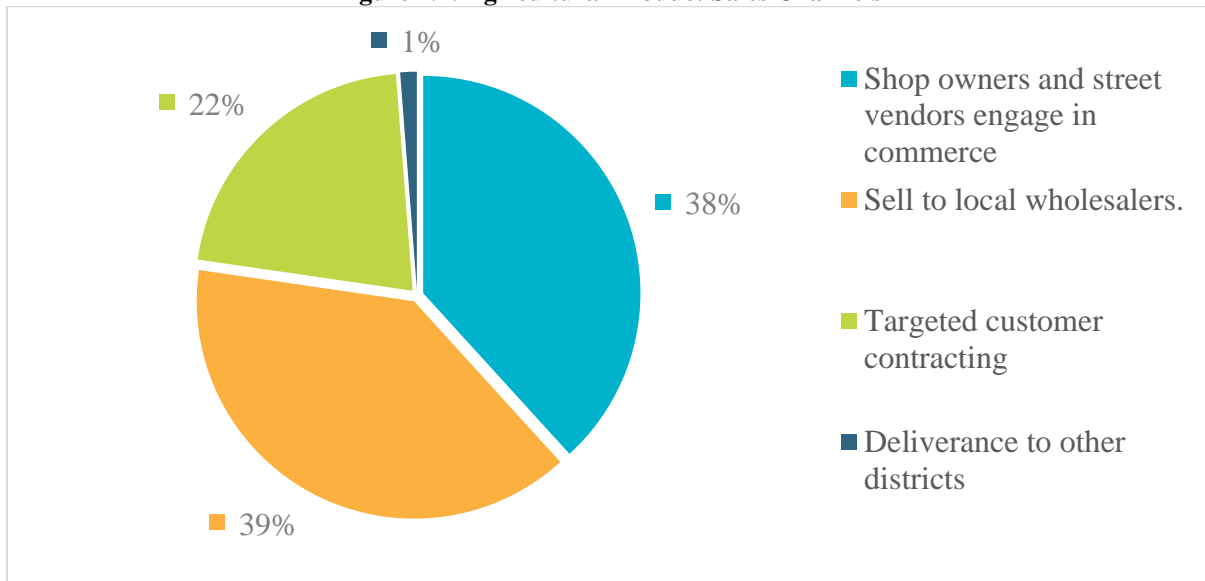
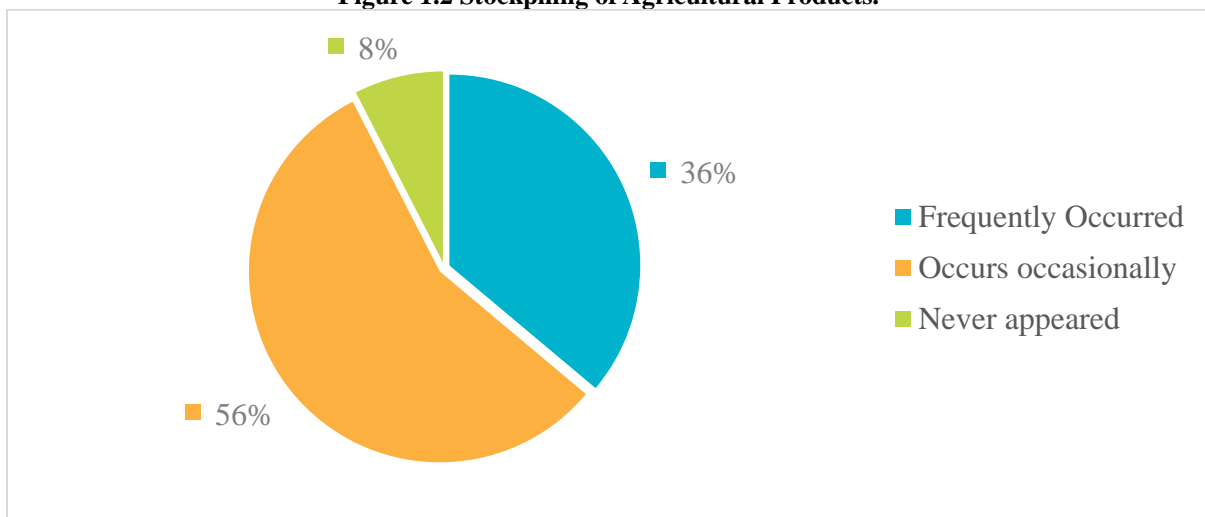


Figure 1.2 Stockpiling of Agricultural Products.



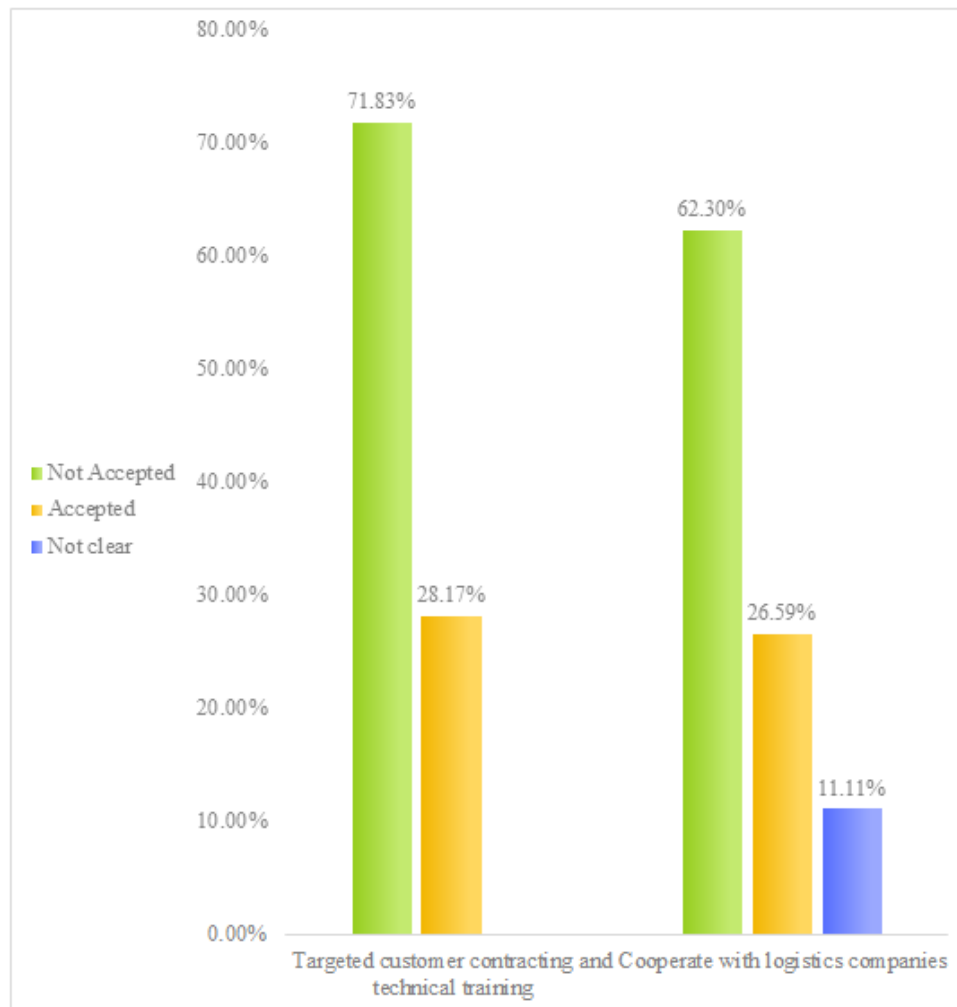
The survey data presented in Figure 1.1 clearly discerns the singularity of the marketable agricultural products from Panzhihua—with 39% being dispensed to local wholesalers, 38% being retailed by the seller's own street vending methods, 22% managed through dedicated client contracts, and a mere 1% being transported to other regions. It is evident that the marketable channels for these hibiscus flower agricultural products predominantly rely on conventional methods, with a severe reliance on local wholesalers and primarily comprising of street vendors accounting for the majority. Only a minority are serviced by client contracts directed towards specific segments, with no established wholesalers in sight. According to the data presented in Figure 1.2, the current situation of agricultural products stockpiling is particularly dire. Among these products, occasional piling occurs at 56%, recurrent at 36%, while not a single category (just 8%) has ever been stockpiled. It is apparent that the crop of peach blossom agricultural products is profoundly accumulated, resulting in poor returns and exacerbating poverty.

1.2 The cost of cultivating vegetables for farmers is exorbitant, and the land is immensely expensive.

The statistics from the City of Panzhuhua's Economic and Social Development Statistical Bulletin indicate: a total of 67.7 million acres of cropland were sown throughout the year, a decline of 0.1%; the area dedicated to oil seeds planting was 2,665 hectares, a decrease of 1.3%; the cultivation of tobacco leaves covered 5,074 hectares, an increase of 0.9%; while the area under vegetable and fungal cultivation expanded by 16,845 hectares, rising by 3.8%. In recent years, with the incessant progression of the economy, prices for all wares have been incessantly surging. The most profound impact on the economic landscape of agricultural products lies in the exorbitant cost of the fertilizers and pest control substances utilized, which elevate the expense of growing vegetables, a situation further complicated by the modest market prices of vegetable and fruit items. Many tillers convey their distress over the exorbitant prices of fertilizers and other merchandise, asserting that they are unaffordable and even lead to spoilage of agricultural products due to inability to sell them, inflicting substantial losses on the cultivators. Furthermore, the majority of farm households, due to a scarcity of communication channels with e-commerce and logistics providers, sell their wares through personal stalls accounts for 85%, while it is challenging for individual consumers to purchase vegetables from such settings due to the high cost of table space, causing numerous farm families to struggle, ultimately unable to derive profits and leading a meager, impoverished life. Furthermore, with the acceleration of urbanization, land resources have become increasingly scarce. The farmland of the peasantry is appropriated for urban construction, leading to a decline in agricultural plot size, an insufficient supply of land, compelling elevated territory prices. Furthermore, factors such as soil contamination and erosion further exacerbate these challenges, necessitating the enhancement and management of many farms, thereby inflating the cultivation costs.

1.3 The majority of farmers are of advanced years, with a profound adherence to traditional ideologies.

Figure1.3 Whether farmers accept targeted customer contracting and technical training to cooperate with logistics companies.



Please find Figure 1.3 wherein farmers indicate their acceptance of customer contract engagement and technical training, as well as their collaboration with logistics companies: It is manifest from survey data that the majority of these cultivators are not receptive to targeted customer contracting and technical training, nor do they engage in collaboration with logistics firms; for the majority are of advanced age, ignorant of internet platforms and partnerships with several logistics companies, harboring fears of fraud and deceit, thus declining the opportunity for training and collaboration.

Piaotian is considered the top retirement destination, making it an ideal choice for this distinction. We surveyed the farming conditions in Rense and the communities of Xinmin in Ynpan County, as well as the wholesale plastic pipe retail establishment of Shanybi County's World-Materials. The results showed that most of the farmers are elderly, with an average age of over 70. Only a few young people have returned to their hometowns to farm. This phenomenon indicates that many farm households are struggling to keep up with the rapidly changing times. They are not familiar with the latest trends in e-commerce and logistics, which makes it difficult for them to sell their agricultural products and earn a profit. Additionally, due to their age and traditional values, many farmers are hesitant to use smartphones and distrustful of e-commerce and logistics due to online scams. This lack of trust hinders collaboration with e-commerce and logistics, leaving them with no choice but to sell their products at stalls or purchase from nearby merchants.

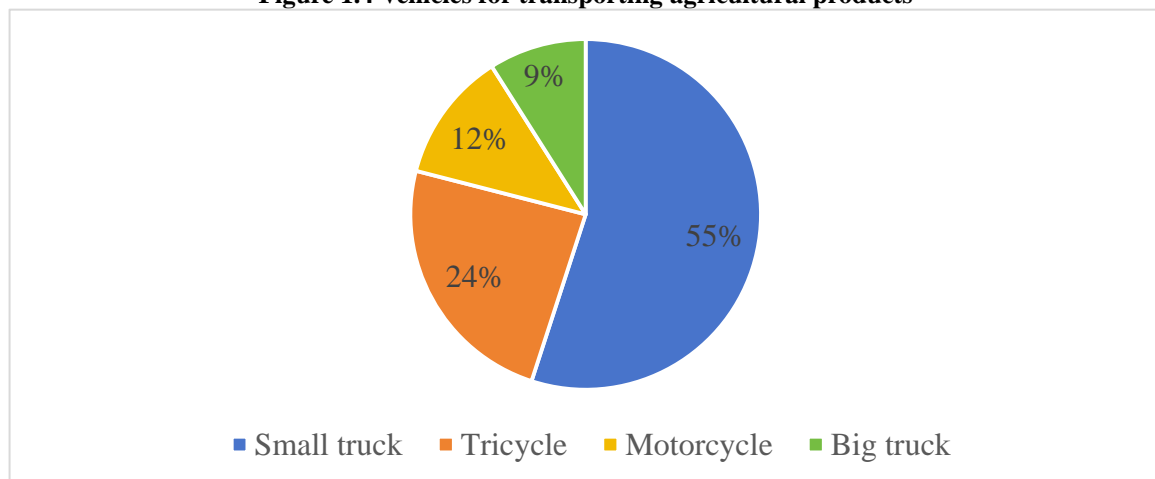
1.4 The lack of accessible transportation options and high transportation costs in rural areas are significant obstacles to economic growth and development.

In the realm of e-commerce and logistics, transportation is a crucial component, and seamless travel is more effective in promoting regional economic development than any other factor. Azaleas thrive in the erosion and erosive mid-slope hills and mountainous valleys. Travel is particularly challenging in rural areas where the terrain is steep and the roads are treacherous. Farmers face difficulties in transporting large quantities of vegetables and fruits, which impedes the sale of agricultural products. These difficulties include the extended duration of transportation, the risk of damage en route due to compression, and the arduous journey. Additionally, due to the lack of rural infrastructure, the cost of transporting goods between regions is high, resulting in lower prices and minimal profits.

According to the National Economic and Social Development Statistical Bulletin of Panzhihua City, the city's graded roads are 4,321.93 kilometers and expressways are 233 kilometers. Throughout the year, 13.2 million road passengers were transported, the passenger turnover volume was 520.91 million ton-kilometers, the cargo transportation volume was 81.33 million tons, and the cargo turnover volume was 5,378.35 million ton-kilometers. The domestic railway operating mileage is 181.6 kilometers; the number of domestic railway stations is 18; the annual railway passenger volume was 820,000, and the railway freight volume was 23.1687 million tons. The waterway passenger turnover was 14.0945 million ton-kilometers, and the waterway freight turnover was 19.7223 million ton-kilometers.

At the same time, public transportation in Panzhihua is underdeveloped. There are relatively few public transportation networks in rural areas and a lack of direct transportation to the city. As a result, the transportation of agricultural products requires multiple transfers, which increases transportation time and costs. According to the analysis of data obtained from the survey, the main means of transportation for agricultural products in rural areas include small trucks, tricycles, motorcycles and large trucks, as shown in Figure 1.4:

Figure 1.4 Vehicles for transporting agricultural products



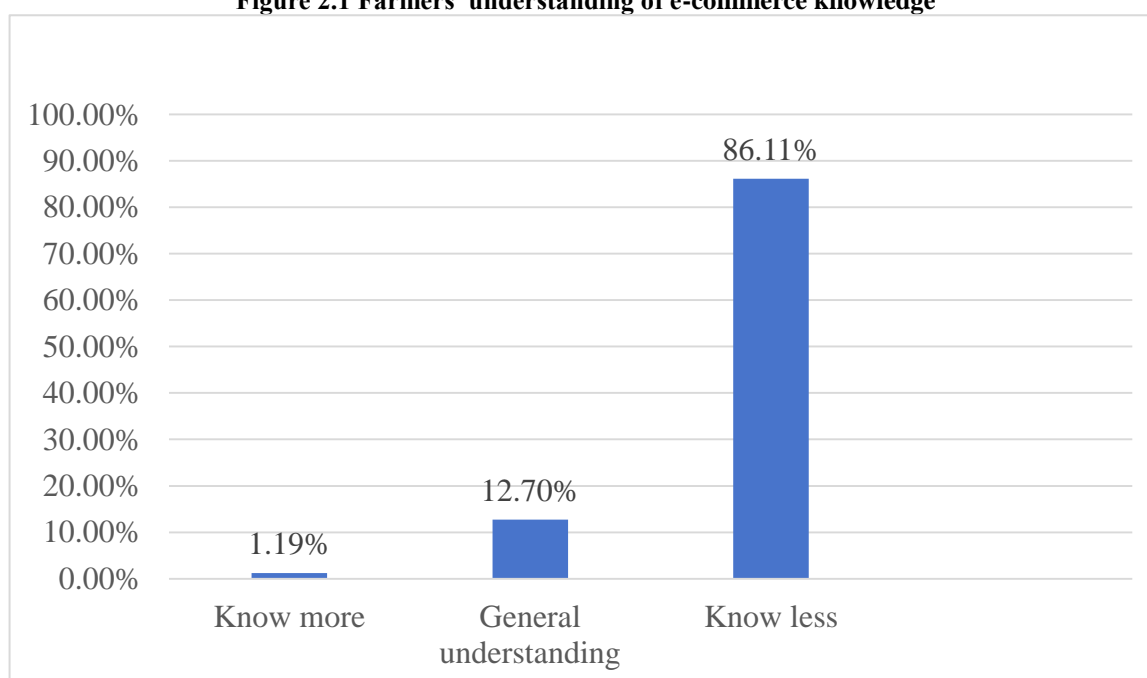
According to the survey results, the main means of transporting agricultural products used by local farmers in Panzhihua are small trucks, tricycles, motorcycles, and large trucks. Most farmers use small trucks, followed by tricycles, and only a few use large trucks to transport agricultural products. Due to the imperfect local transportation infrastructure, transportation in villages and towns takes a long time, and small transportation tools prevent agricultural products from being transported to their destinations quickly, stably, and efficiently. This not only causes damage to agricultural products during transportation, but also reduces transportation efficiency. . Therefore, the development of rural transportation is also one of the important issues in the development of rural e-commerce and logistics.

II. The current situation and problems faced by e-commerce and logistics companies

2.1 Farmers lack e-commerce knowledge

Since the 18th National Congress of the Communist Party of China, the party and the country have made historic achievements, and the overall victory in the fight against poverty has marked that our party is leading the people to create a better life, and the pace of poverty-stricken areas has gradually accelerated. The emergence of e-commerce and logistics has continuously enhanced the economic strength of various regions. However, analysis from the collected data shows that there are fewer rural households in Yanbian County and Renhe District of Panzhihua who understand e-commerce and logistics, as follows:

Figure 2.1 Farmers' understanding of e-commerce knowledge



According to the survey results, local farmers in Panzhihua generally know less about e-commerce knowledge, and only 1.19% of farmers know a lot about e-commerce knowledge. First of all, among all the farmers surveyed, most of the farmers in Panzhihua are generally in the middle-aged and elderly stages, and their education level is generally low, so they know little about e-commerce knowledge. Secondly, many local young people in Panzhihua go out to work, and it is usually the elderly who work at home and farm. They do not know the Internet and are not good at electronic devices, so there are almost no opportunities to gain access to e-commerce knowledge. This also makes it difficult to achieve good cooperation between farmers, e-commerce and logistics. During the investigation, many farmers expressed their desire to cooperate with logistics companies and express their willingness to sell agricultural products through e-commerce platforms. However, most of them gave up the idea because they were worried that they would not be able to learn. Therefore, local governments should increase efforts to cultivate rural e-commerce talents and expand the influence of rural e-commerce by organizing relevant training and education.

The development of rural e-commerce and logistics in this region is not comprehensive enough, and the economic foundation is not solid. In addition, the handover between e-commerce logistics and farmers is not fixed, there are many retail traders, and the self-employed economy cannot be improved. At the same time, e-commerce and logistics talent management, technology training, supply demand and other aspects need to be further improved.

2.2 E-commerce and logistics management and transportation systems are low

In the post-epidemic era, e-commerce and logistics development are continuing to progress, but traditional e-commerce and logistics development are no longer suitable for rural development. There are many self-employed people in rural areas. Selling agricultural products through traditional e-commerce and logistics will result in a lack of timeliness, and it will be difficult for vegetables and other products with a short shelf life to achieve optimal quality. Secondly, the transportation situation in Panzhihua is poor. E-commerce and logistics companies are scattered and scattered. The system from purchasing, packaging, loading, transportation, and unloading is weak. The transportation cost is high and the expected results cannot be achieved. Some fruits, such as strawberries and mangoes, are even crushed during transportation, affecting their taste and reputation. In addition, the transportation in Panzhihua is inconvenient, which prevents many logistics companies from transporting agricultural products to big cities that are conducive to economic development for sale [4]. As shown in Figure 2.2, since the "Thirteenth Five-Year Plan" [13], the "One Ring and Six Radiations" highway network has been continuously improved, forming a highway network with highways as the skeleton, ordinary national and provincial roads as the trunk lines, and rural roads as the veins, with smooth and open access to the outside world. Convenient internal road network. However, at present, Panzhihua's external transportation mainly relies on the Beijing-Kunming Expressway, Chengdu-Kunming Railway and Baoying Airport. The high-speed road network composed of Panzhihua Expressway, Lipan Expressway and Yanjiang Expressway has not yet been fully opened. The Panzhao Railway and the Yixi-Panli Railway are still In the planning stage, there are no quick access routes in the north-south and east-west directions; in terms of national and provincial trunk roads and county and township roads, there are problems such as low road grades, many diseases, long detours, and insufficient interconnection capabilities with surrounding cities.

Figure 2.2 Panzhihua City's highway network situation at the end of the "Thirteenth Five-Year Plan" period

Road grade	Mileage open to traffic (km)					Total	Proportion
	First-class highway	Second-class highway	Third-class highway	Forth-class highway	Extra grade highways		
State road	17.25	137.3	117.09	88.97		360.62	7.11%
Provincial highway	15.26	77.37	35.78	346.69	86.95	565.05	11.14%
County road	11.11	49.32	30.6	1089.66	120.62	1301.3	25.65%
Rural road		1.5	2.33	1013.12	156	1172.95	23.12%
Village road			11.97	1273.61	388.56	1674.14	32.99%
Total	43.62	256.48	197.78	3815.05	752.14	5074.06	
Proportion	0.86%	5.23%	3.90%	75.19%	14.82%		

Highway network density 68.44 kori / hyakata Kubo, 50.8 kouru / 10000

2.3 The lack of skilled professionals in the fields of e-commerce and logistics is a major issue that needs urgent attention.

Although the rapid growth of e-commerce and logistics has led to a plethora of professionals in these sectors in recent years, there is still a significant void in the field of high-tech talent, as shown in Figure 2.3. It is estimated that by 2025, China's rural e-commerce talent gap will reach 35 million individuals, which poses a challenge that requires continuous efforts in talent training. As shown in Figure 2.4, the majority of the agricultural product e-commerce audience comprises individuals with moderate cultural qualifications, including 1% of primary education graduates, 50% of secondary education graduates, 32.5% of high school graduates, and only 16.5% of university graduates. Most university graduates in the e-commerce sector generally eschew participating in the development of local rural e-commerce. As a result, many top-tier technical professionals prefer positions with higher remuneration and prefer to work in major urban centers such as Beijing, Shanghai, and Guangzhou. Few return to their hometowns to engage in professional endeavors, resulting in a scarcity of high-end technological talent. On the other hand, online retail has become more convenient in the post-pandemic era. However, most rural farmers in Panzhihua are unaware of e-commerce, and there is a shortage of individuals with a comprehensive understanding of both e-commerce and logistics within the local community. However, in cities like Panzhihua, where transportation is limited but there is a

wide variety of fruits and vegetables available, a diverse range of skills is necessary to drive the continuous development of local economies.

Figure 2.3 Forecast of rural e-commerce talent gap in my country (10,000 people)

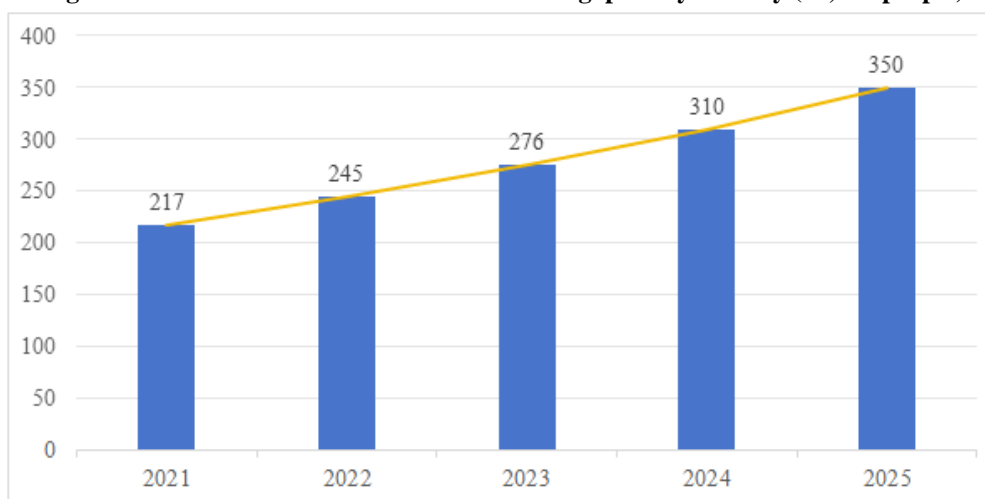
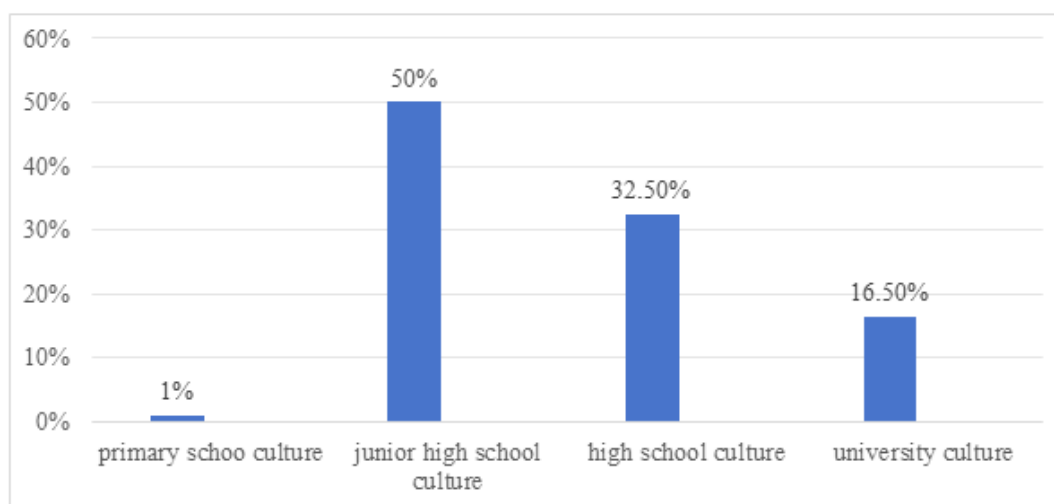


Figure 2.4 Cultural level of e-commerce talents



2.4 Marketing of agricultural products lags behind

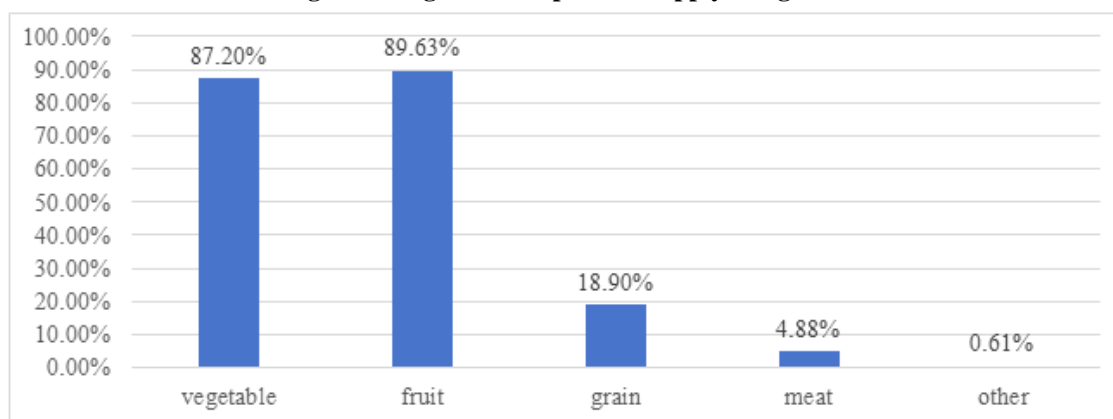
With the rapid advancement of technology, our era boasts a wide variety of transgenically modified, artificially grown, and carefully nurtured vegetables that are sold at exorbitant prices in the city's markets. These products are heavily promoted through vigorous advertising campaigns that resonate deeply with the masses. In contrast, the profit margin for e-commerce and logistics in the transgenic food industry is much greater, and its market presence exceeds that of agricultural products, greatly increasing the risk of lagging agricultural product marketing. Moreover, local agricultural products are mainly promoted through one particular variety, with mangoes being the most renowned fruit, followed by strawberries. However, other lesser-known fruit varieties are burdened with an excess of inventory due to their lack of popularity. The e-commerce and logistics sectors also struggle with issues such as transport limitations, subpar product quality, and a monotonous marketing approach, which severely hinder the rapid development of local economies.

Furthermore, the insurance and transportation stipulations for the products of Pianzhihua are quite elevated. However, due to the inadequate logistics and cold storage facilities in rural areas, perishable goods easily spoil and deteriorate during transport, which negatively impacts the quality and sale of the product.

2.5 The unpredictability of supply and demand for agricultural products.

For the majority of Chinese farmers, the principal strategy in agricultural production is traditional methods. However, consumer demand is becoming increasingly diverse and individualized, leading to a persistent mismatch between supply and demand in China's agricultural supply chain. Production and sales strategies within this chain often do not align with market demands, and the sudden onset of pandemics exacerbates the uncertainty within the supply-demand dynamic, leading to imbalances. On the one hand, the provision of agricultural products is contingent upon seasonal and meteorological fluctuations, which are not solely dependent on the objective preferences of consumers. Agricultural products have seasonal periodicity and are influenced by changes in temperature and humidity, making their harvests and qualities frequently dictated by seasonal trends. Without predicting or estimating the harvest of agricultural products, the cyclical nature of crops, their reproductive types, and quality, it becomes challenging to align with consumer demand levels. However, consumers continue to hoard certain commodities, resulting in market misjudgments and situations where the supply chain cannot sustain itself. This is compounded by the inadequacies of the logistics transportation system, which may cause delays or shortages in the delivery of agricultural products. These factors emphasize the inherent uncertainty in the supply and demand of agricultural goods. According to data analytic, the principal categories of agricultural products in supply are vegetables, fruits, grains, and meats, as depicted in Figure 2.5:

Figure 2.5 Agricultural product supply categories



From Figure 2.5, it is clear that the farmers in Panzhihua focus mainly on growing vegetables, fruits, grains, and meats, with vegetables and fruits being the most prominent. Only a small percentage of farmers produce grain and meat, while the rest offer other products. Panzhihua is the sole subtropical fruit production base in Sichuan, abundant in diverse distinctive fruits, and provides fresh fruits all year round. As a result, the majority of local farmers supply fruits.

III. Promote the harmonious development of rural e-commerce and logistics.

The coordinated development of rural e-commerce and logistics is an effective strategy to boost the economy of Panzhihua. It allows e-commerce platforms to reach every household in the countryside and reap greater benefits from online sales. Through logistics firms, a variety of agricultural products, such as vegetables and fruits, can be transported to densely populated major cities, bringing Panzhihua's produce to the forefront and establishing a favorable reputation. In the post-pandemic era, it is essential to seize the opportunity for the coordinated development of rural e-commerce and logistics, driving the economic growth of Panzhihua to new heights.

3.2 Develop contingency logistics plans and improve short-distance logistics.

Given the unpredictability of agricultural product supply and demand, it is crucial to develop contingency logistics plans and improve short-chain logistics. First, the government or relevant authorities should establish an emergency logistics command center to coordinate all resources, develop contingency logistics plans, and ensure the timely allocation of emergency supplies. Second, based on regional characteristics and potential emergencies, emergency supplies should be proactively stockpiled. At the same time, the quality and quantity of supplies must be regularly inspected to ensure they are ready when needed. By optimizing the logistics network layout, the number of logistics stages can be reduced, thereby reducing logistics costs. For example, centralized delivery and shared transportation methods can improve transportation efficiency, while technologies such as the Internet of Things and big data can enable real-time monitoring and smart

allocation.

3.3 Improving Farmers' Understanding of E-commerce and Logistics

The key to successful collaboration between e-commerce and logistics is to ensure that farmers in the Panzhihua area understand both industries. Firstly, the government should implement supportive policies that encourage farmers to participate in e-commerce and logistics, making sure that these two industries are integrated into the region's economic development. Secondly, the region should increase its public relations efforts through various channels such as television, radio, newspapers, and the Internet. This will help the older generation embrace the new era and allow countless farm households to learn about the growth and prospects of these two industries, breaking down the barrier of age. Most importantly, the region should provide educational support by offering systematic training courses to farmers, ensuring that they are familiar with the electronic and logistics operational models. This will facilitate their collaboration and lead to mutual prosperity.

Additionally, the government could establish an information platform for rural e-commerce and logistics, providing farmers with a wealth of information such as policies, market updates, and training resources. Farmers can use this platform to stay up-to-date with the latest industry trends and demands.

3.4 Strengthen the construction of rural logistics infrastructure and increase the policy support system.

Government support is essential for industrial development, particularly in the integrated development of rural e-commerce and logistics. The government should introduce legislation and policies that consider the foundation infrastructure of rural e-commerce and logistics, fostering its evolution and establishing a swift and efficient logistical system. The government should prioritize the development of rural e-commerce and logistics by first enhancing the foundation of rural logistical infrastructure, increasing investment, ensuring prompt funding, and devising comprehensive policies for rural logistics, including land utilization and financial support. Secondly, the government should plan the layout of rural logistical infrastructure in conjunction with the development of rural economic activity and the construction of an efficient e-commerce logistics network, ensuring that rural e-commerce logistics align with agricultural production and market demand. Finally, the government can offer convenient services, simplify approval processes, reduce corporate expenses, and promote sustained economic expansion.

3.5 Developing a comprehensive e-commerce and logistics management system

In the rapidly evolving retail and logistics industries, there are still many shortcomings that need to be addressed. Firstly, it is important to create a customized e-commerce logistics management system that takes into account local characteristics and minimizes inherent risks. Secondly, a robust supply chain management system should be established, covering supplier selection, procurement, inventory management, and logistics distribution. By improving supply chain management, costs can be reduced and efficiency can be increased, resulting in better services for consumers. We need to develop efficient marketing strategies, evaluate the effectiveness of each marketing activity, strengthen communication and cooperation with farmers, collect and analyze consumer information, optimize e-commerce and logistics management systems, and improve overall operational efficiency.

3.6 Optimizing Talent and Technical Training

Given the weaknesses of the educational system in the Panzhihua, it is imperative to improve talent and technology cultivation. To achieve this, collaboration between institutions and businesses is necessary. Universities and colleges in the province should cooperate with local e-commerce enterprises to carry out customized talent training in professional fields to improve the practical application ability of talents. A talent repository should be constructed to meet market demand, retaining local talent and attracting outstanding excellence, ensuring a seamless flow of supply and demand within the talent pool. Through local academia-industry collaboration, local technological needs can be identified and multi-faceted talent can be cultivated. In addition, farmers can be organized for agricultural technology guidance, such as corn cultivation, and technicians can attend lectures on e-commerce and logistics, providing theoretical and professional guidance. Practical training should also be organized for technical personnel in various regions of Panzhihua, enhancing the efficiency of rural logistical delivery and fostering a symbiotic development between e-commerce and logistics, ultimately achieving mutual benefit.

3.7 Develop public transportation in rural areas

The lack of transportation infrastructure in rural areas remains a significant challenge. To address this issue, the government should encourage and support the development of mass transit within the agricultural sector. One effective strategy is to offer subsidies and tax exemptions to attract investors and enterprises to participate in rural public transportation construction. Secondly, rural regions generally have a larger area,

making them ideal for the use of new energy vehicles for public transit operations. The government can provide corresponding subsidies and preferences to encourage carriers to introduce new energy vehicles, reducing environmental pollution and energy consumption. Finally, it is important to strategically plan the routes of public transportation based on the demographic distribution throughout rural areas and the origin of agricultural products. The network should include the main villages and hubs for agricultural products, making it easier for farmers to travel and transport their produce.

IV. Conclusion

In recent years, the e-commerce industry has become a hot development industry. E-commerce and logistics companies should take advantage of the market reshuffle. Starting with consumer demand, they should use advanced intelligent technological tools to bridge gaps and integrate information, thereby creating a novel business model that better integrates the traditional economy with innovative e-commerce. This will help them turn the tide of passive market situations and secure a favorable position within the reconfigured industry landscape. During the pandemic, rural e-commerce and logistics in Panzhihua flourished. However, in the post-pandemic era, these sectors have progressively decelerated, revealing numerous latent issues. With comprehensive research and investigation, the government can offer diverse policy support to propel the economic evolution of rural districts, increase the earnings of tillage households, and foster the rapid localization ascent of logistics companies around Panzhihua, achieving mutual benefit.

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