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Current Situation and Challenges of the Vegetable Industry in Shenxian County, Shandong Province

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ABSTRACT

Shenxian County, known as "China's No. 1 Vegetable County," is a leading national base for facility vegetable cultivation, and its vegetable industry serves as a vital pillar of rural revitalization in southwestern Shandong Province. Based on statistical data from 2015 to 2024, including vegetable output, employment, GDP contribution, product-category structure, and sales markets, this paper reviews the current development status of the local vegetable industry. On this basis, it analyzes three core challenges: a fragmented brand landscape, prominent weaknesses in the industrial chain, and limited coverage of digital agriculture. Overall, the vegetable industry in Shenxian County has significant scale advantages, but bottlenecks in branding, industrial-chain development, and digitalization continue to constrain its high-quality upgrading.

KEYWORDS

Shenxian County; Vegetable Industry; Facility Vegetables; Digital Agriculture.

1. INTRODUCTION

Shenxian County, known as "China's No. 1 Vegetable County," has developed a vegetable industry that serves as a core pillar of rural revitalization in southwestern Shandong Province and a key driver of county-level economic growth. The industry not only employs a large number of local laborers and continuously increases its contribution to the county economy, but has also formed a diversified production and marketing system that extends to major urban agglomerations across China. As a result, it occupies an important position in the vegetable supply system of North China and even the country as a whole.

In recent years, with the rapid development of facility agriculture, agricultural product processing, and smart agriculture nationwide, vegetable industries in various regions have been moving toward large-scale, branded, and digitalized development. Although Shenxian County has basic advantages in planting scale, output, and market channels, its deeper development shortcomings have gradually become more prominent. Problems in brand building, industrial-chain extension, and digital-technology penetration restrict the improvement of industrial added value. To clearly assess the actual development level of the vegetable industry in Shenxian County and accurately identify its development bottlenecks, this paper relies on ten-year statistical data from the Shandong Provincial Bureau of Statistics, the Shenxian County Bureau of Statistics, agricultural departments, and official research literature. It objectively reviews the industry's development status from multiple dimensions, including production capacity, employment, economic contribution, product structure, and sales markets, and systematically analyzes the existing core challenges. This analysis provides a factual basis for subsequent quality improvement, efficiency enhancement, transformation, and upgrading of the vegetable industry in Shenxian County.

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2. CURRENT SITUATION OF THE VEGETABLE INDUSTRY IN SHENXIAN COUNTY

Shenxian County is home to the largest facility vegetable cultivation base in China, and the vegetable industry serves as a core industrial pillar for rural revitalization in southwestern Shandong Province. As shown in Figure 1, from 2015 to 2024, vegetable output in Shenxian County generally followed a pattern of initial stability followed by growth. During the first five years, output fluctuated only slightly and remained relatively stable. From 2020 onward, it entered a phase of sustained growth, with the production scale expanding year by year. Over the past decade, output has steadily increased and reached a new high in 2024, demonstrating the continuous expansion and strong development momentum of the local vegetable industry.

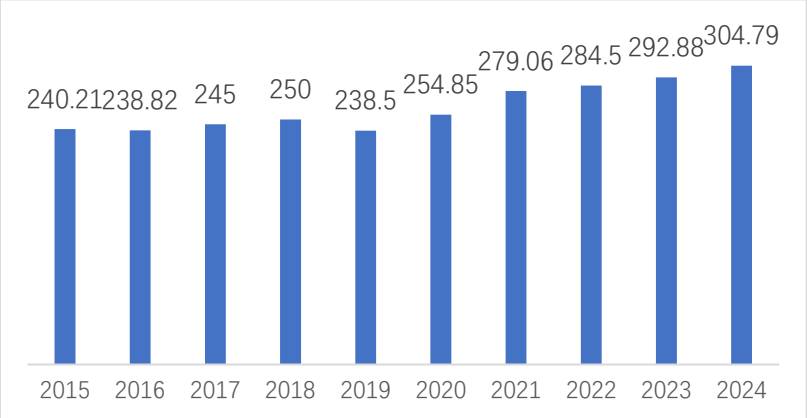


Figure 1. Vegetable output of Shenxian County from 2015 to 2024 (Unit: 10,000 tons)

Data source: Shandong Provincial Bureau of Statistics

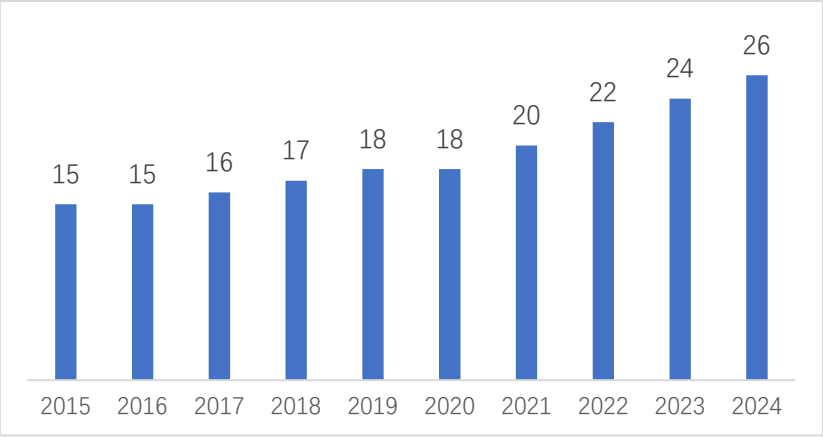


Figure 2. Number of employees in the vegetable industry of Shenxian County from 2015 to 2024 (Unit: 10,000 persons)

Data source: Compiled from Xinhua News Agency, "Shandong Shenxian County: Keeping Pace with the New Era, Facing the New Future"

As shown in Figure 2, from 2015 to 2024, the number of employees in the vegetable industry of Shenxian County showed a steady upward trend. From 2015 to 2019, employment remained relatively stable, with most workers mainly engaged in traditional planting. After 2020, employment increased rapidly with the extension of the industrial chain, covering multiple links such as planting, processing,

and circulation. The continuous expansion of the workforce provides strong support for local employment, income growth, and industrial development.

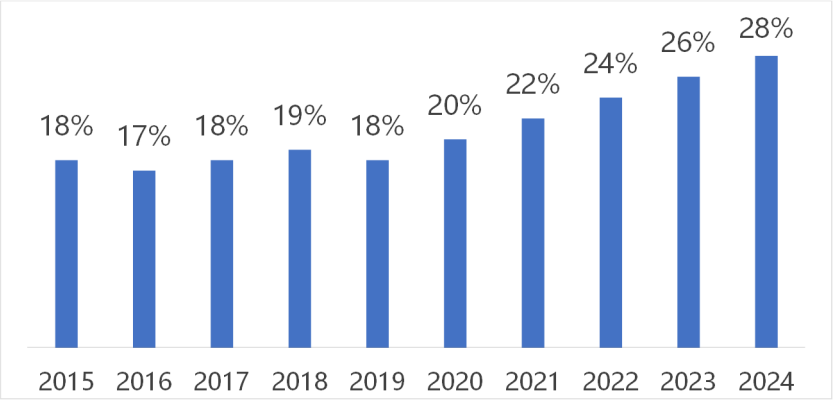


Figure 3. Contribution rate of the vegetable industry to the GDP of Shenxian County from 2015 to 2024 (Unit: %)

Data source: Shandong Provincial Bureau of Statistics

As shown in Figure 3, from 2015 to 2024, the contribution rate of the vegetable industry to GDP in Shenxian County increased steadily overall. From 2015 to 2019, it remained between 17% and 19%, with only small fluctuations. After 2020, it continued to rise, reaching approximately 28% in 2024. As a core pillar of the county economy, the vegetable industry effectively drives local economic growth and industrial development.

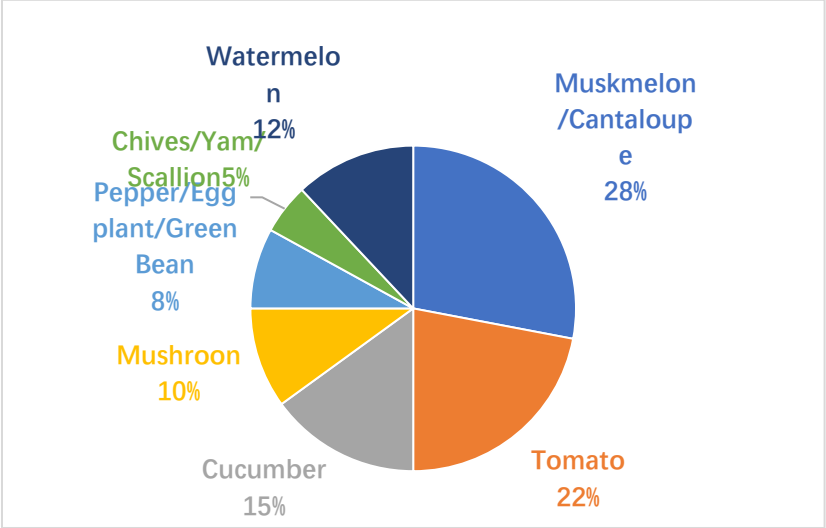


Figure 4. Vegetable categories produced in Shenxian County in 2024

Data source: Shenxian County Bureau of Statistics

As shown in Figure 4, in 2024, vegetable production in Shenxian County was dominated by gourds and solanaceous fruits. Melons and cantaloupes accounted for the highest proportion, followed by tomatoes, cucumbers, watermelons, and other categories. Edible fungi also accounted for a certain proportion, while peppers, eggplants, leeks, and other vegetables served as supplementary categories. This rich product structure has formed an industrial pattern centered on facility-grown melons and vegetables.

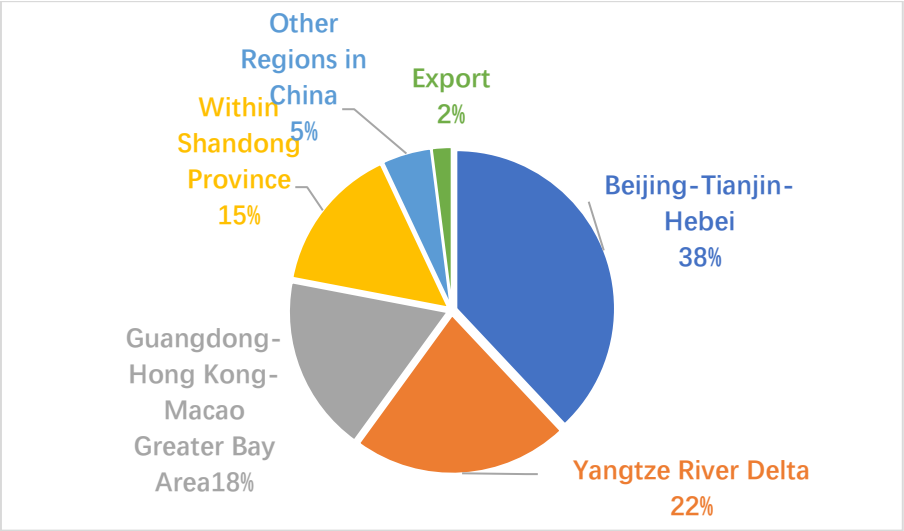


Figure 5. Main sales regions of vegetables from Shenxian County in 2024

Data source: Department of Agriculture and Rural Affairs of Shandong Province

As shown in Figure 5, in 2024, vegetables from Shenxian County were sold mainly in the domestic market. The Beijing-Tianjin-Hebei region accounted for the highest proportion, followed by the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, and surrounding areas within Shandong Province. A small share was sold to other regions across the country. Exports were mainly directed to Japan, South Korea, Russia, and Southeast Asia, but they accounted for a relatively small proportion. Overall, the county has formed a market pattern centered on large and medium-sized domestic cities, with exports serving as a supplementary channel.

3. CORE CHALLENGES FACING THE VEGETABLE INDUSTRY IN SHENXIAN COUNTY

(1) Fragmented brand landscape and weak collective branding. The vegetable industry in Shenxian County lacks unified brand standards and certification systems, resulting in relatively low brand credibility among consumers. Only a few well-known brands exist, such as "Shenxianxiansheng" and "Gudawang. [1]" Moreover, according to the "Shenxian County Agricultural Products Regional Public Brand: Development Status and Improvement Strategies" published by the Shenxian County Government Office in December 2025, "primary product sales account for 85%, while only 15% of products undergo processing." This indicates that the industry has not yet formed a strong brand premium.

(2) Incomplete industrial chain. According to the "2024 National Economic and Social Development Statistical Bulletin" issued by the Shenxian County Bureau of Statistics, the vegetable planting area in Shenxian County reached 657,000 mu, with a total output of 3,047,900 tons. The industry is still dominated by primary planting, while the proportion of secondary processing remains relatively low. Most processing is limited to preliminary sorting, and deep processing remains underdeveloped. In transportation, cold-chain logistics capacity is also insufficient, which limits product added value. [2]

(3) Limited application of digital agriculture. Although Shenxian County has introduced smart technologies such as "Farm Butler" and has carried out digital pilot projects in cooperation with Tencent Cloud, their production coverage remains limited. Digital facilities are relatively advanced in some localized pilot areas, but their overall distribution remains uneven. The digital penetration

rate among small and medium-sized greenhouses and scattered farmers remains low, and many farmers have never used IoT, AI, or other smart planting tools. [3]

4. SUMMARY

Based on statistical data from 2015 to 2024, the vegetable industry in Shenxian County has a solid development foundation and good growth momentum. Over the past decade, total vegetable output has steadily increased, the industrial workforce has continued to expand, and the industry's contribution to county GDP has strengthened year by year. The county has formed a production structure dominated by facility-grown melons and vegetables and supplemented by diverse crop categories, along with a mature sales network centered on large and medium-sized domestic cities. Its industrial scale advantage is prominent, and the industry plays a key role in increasing farmers' income, stabilizing the local economy, and ensuring regional vegetable supply.

However, these scale advantages have not yet been fully transformed into industrial competitive advantages. Three prominent shortcomings currently exist. First, brand development lags behind, with fragmented business entities and an incomplete regional public brand system. Primary products account for more than 80% of external sales, resulting in weak product pricing power. Second, the industrial-chain structure is unbalanced, with heavy reliance on front-end planting, slow development of deep-processing industries, insufficient cold-chain logistics support, and generally low overall added value. Third, digital agriculture development is uneven. Digital pilots have been implemented only in limited areas, and the intelligent transformation of scattered farmers and small and medium-sized greenhouses still lags behind, with insufficient empowerment from modern technology.

Overall, the vegetable industry in Shenxian County is at a critical stage of transitioning from scale expansion to high-quality development. In the future, efforts should focus on three directions to address these shortcomings: brand standardization, full industrial-chain improvement, and comprehensive digital transformation. By connecting all links from production, processing, and warehousing to sales, the industry's scale potential can be fully unleashed. This would promote Shenxian County's transition from a large-scale vegetable producer to a competitive vegetable industry hub and further consolidate the industrial foundation for rural revitalization.

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REFERENCES

[1] Sun, Y. F. (2026, January 6). "Shenxian melon" selected for the 2025 agricultural brand premium cultivation list. https:// www.cfsn.cn/news/detail/268/328465.html.

[2] Shenxian County Bureau of Statistics. (2025). 2024 national economic and social development statistical bulletin. Shenxian County Bureau of Statistics.

[3] Wang, Y. D., Sun, Y. M., Wang, Y., et al. (2024). Exploration of digital transformation in major agricultural counties-A survey from Shenxian County, Liaocheng City, Shandong Province. Rural Work Communication, (10), 34-35.