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**| RESEARCH ARTICLE**

## **Study on the Integrated Development of Cinnamon Industry in Fangchenggang of Guangxi**

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**| ABSTRACT**

SWOT analysis was adopted to analyze the integrated development of the cinnamon industry in the city of Fangchenggang. The integrated cinnamon industry in the city enjoys great advantages and opportunities, but there are also some problems in its development process, such as the low educational level of cinnamon farmers, weak driving ability and brand influence of leading enterprises, as well as the lack of a strong benefit coupling mechanism. To solve these problems, this paper puts forward several suggestions, such as extending the industrial chain to realize the integration of the primary, secondary and tertiary industries, attaching importance to brand building, optimizing the structure of practitioners, and strengthening the training of cinnamon farmers, optimizing a number of innovative regional enterprises that can lead the development of cinnamon industry and closely connects farmers, and improving the benefit coupling mechanism between farmers and enterprises.

**| KEYWORDS**

Cinnamon Industry; Industrial Integration; SWOT Analysis; Fangchenggang

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### **1. Introduction**

Industrial integration refers to a new agricultural organization mode and process in which new industries, new business formats, and models in the agricultural industry are formed through the fusion and cross reorganization among different sectors of agricultural departments and between the secondary and tertiary industries related to agriculture and rural areas.[1] Industrial prosperity is the key point of rural revitalization. The industry is the foundation of development, and only with a thriving industry can farmers' income increase steadily. Xi Jinping, the General Secretary of the CPC Central Committee, pointed out that "a prosperous industry is a prerequisite for solving all problems in rural areas." Industrial integration of agriculture is conducive to the development of urban-rural integration and agricultural supply-side reform.[2] Taking cinnamon industry in the city of Fangchenggang as the research object, this research is conducted on the basis of field investigation in the city and relevant literature. It analyzes the current situation of the integrated development of the cinnamon industry, discusses the advantages and disadvantages, opportunities and challenges in the integrated development of the cinnamon industry in Fangchenggang, and provides countermeasures and suggestions, which may be of great significance for the healthy development of the integrated cinnamon industry in the city.

#### **1.1 Current situation of the integrated cinnamon industry in the city of Fangchenggang**

##### **1.1. Cultivation and yield of cinnamon in Fangchenggang**

Table 1-1 shows that in the recent five years, cinnamon production in the city of Fangchenggang accounted for a very important part of Guangxi. In 2016, cinnamon production was 14,426 tons, accounting for 38.70% of the total Guangxi. In the year 2018, which has lower yields, the production was 8,891 tons, accounting for 25.30% of the total Guangxi. The yield of cinnamon decreased significantly in 2018 and then increased slightly in 2019 and 2020.

Table 1-1 Cinnamon yields in Fangchenggang and Guangxi in recent five years

Year	Fangchenggang (t)	Guangxi (t)	Percentage (%)
2016	14,426	37,278	38.70
2017	14,999	40,556	36.98
2018	8,891	35,153	25.30
2019	9,331	28,841	32.35
2020	10,823	29,747	36.38

Data source: Fangchenggang Forestry Bureau and Department of Forestry of Guangxi Zhuang Autonomous Region

Table 1-2 shows that in 2020, the total planting area of cinnamon in the city of Fangchenggang is 648,340 mu (including 500,000 mu in Fangcheng district, 8,340 mu in Shangsi, and 140,000 mu in Dongxing), with an annual output of 10,823 tons of cassia bark (including 8,790 tons in Fangcheng, 33 tons in Shangsi and 2,000 tons in Dongxing) and 716 tons of cassia oil (including; 600 tons in Fangcheng district, 116 tons in Dongxing). Most of the cassia bark and cassia oil is produced in the Fangcheng district, with 80 tons of benzaldehyde and 10 tons of o-methoxy cinnamaldehyde, with an output value of 388 million yuan.

Table 1-2 Planting area of cinnamon, annual output of cassia bark and distribution of cassia oil in Fangchenggang in 2020

	Region	Planting area (mu)	Annual cassia bark output (t)	Cassia oil (t)
	Fangcheng District	500,000	8,790	600
Fangchenggang	Shangsi	8,340	33	0
	Dongxing	140,000	2,000	116

Data source: Fangchenggang Forestry Bureau

## 1.2 The integrated development mode of the cinnamon industry is gradually diversified

An integration mode at the primary level is "company + cooperative + cinnamon farmers." In other words, this mode takes enterprises as the leading role and the initial deep processing, transportation, and sales of cinnamon as the key links, and puts emphasis on the production and sales of cinnamon products and the organic connection with bases and farmers for integrated management, so as to build an economic community with "shared risks and benefits." Cinnamon enterprises in Fangchenggang mainly adopt primary integration mode. A relatively advanced mode is "government + leading enterprises + cooperatives + cinnamon farmers." Under this mode, industrial consortiums of enterprises, scientific research institutions, cooperatives, and farmers are effectively connected. Family farms and traditional small farmers can participate in the whole industrial chain of modern production of the cinnamon industry through placing planting orders, purchasing cinnamon, and providing jobs opportunities for cinnamon farmers. A representative enterprise adopting this mode is Guangxi Gengyuan Spice Co., Ltd., which is the only high-tech leading enterprise in Fangchenggang at present.

## 2. Analysis of the integrated development of the cinnamon industry in Fangchenggang with the technique of SWOT

This paper adopts the SWOT technique to analyze the integrated development of the cinnamon industry in Fangchenggang in order to give full play to advantages, seize development opportunities, avoid related risks, shore up the weak links, and provide the basis for the integrated development of the cinnamon industry.

### 2.1 Strength analysis (S)

#### 2.1.1 Favorable natural environment

Located in 107°28' - 108°36' east longitude and 20°36' - 22°22' north latitude, the city of Fangchenggang is located in the south of the Tropic of Cancer. The climate of the city belongs to the humid and hot maritime monsoon climate of South Asia, with an average annual rainfall of 2,823 mm and average annual rainfall days of 176. Coupled with good vegetation on Shiwang Mountains and water contained in the mountain forests, the city has more than 10 major rivers, with a total length of more than 400 kilometers and a total water volume of 8 billion cubic meters. The amount of precipitation is abundant, and the annual average relative humidity is relatively high. The mountain soil is very fertile, and the soil layer is deep. The city enjoys favorable conditions for developing the cinnamon industry in terms of climate, landform, and soil.

#### 2.1.2 Abundant land resources suitable for planting cinnamon

The land area of Fangchenggang is about 9.31 million mu, of which 678,900 mu is arable land, accounting for 7.2%. Mountainous and hilly areas are 7,280,000 mu, accounting for 78.1%; water area is 740,000 mu, accounting for 8%; the rest is 611,200 mu, accounting for 6.7%. The city locates in a region with middle and lower mountains and a hilly area with a gentle slope. The mountainous area accounts for nearly 80% of the total land area. The Shiwang Mountains run across the central part of

Fangchenggang from the east to the west. With vast mountainous areas, thick layers, and humid climates, the natural fertility of the soil is relatively high. At present, the area of mountains and hills suitable for cinnamon planting is 7.28 million mu, while the planting area of cinnamon in Fangchenggang is only 648,34 mu, accounting for 8.9%. This means that there is a large amount of area that can be developed for planting cinnamon.

### **2.1.3 Long history of cinnamon cultivation**

According to historical records, Guangxi began to grow cinnamon artificially in the Qin, and the Han Dynasties [3] and Fangchenggang started to plant cinnamon more than 2,000 years ago. With traditional agronomic techniques and processing techniques in production, the cinnamon made in Fangchenggang is characterized by thick skin, smooth color, high oil content, excellent use in medicine, and spice blending. In the late 1980s and early 1990s, the people of Guangxi Zhuang autonomous region regarded "developing sub-tropical dominant fruits and economic trees" as "a project for realizing relatively comfortable life," and as a result, cinnamon cultivation was listed as a key project. In 2001, Fangchenggang was named "hometown for famous, special and excellent cinnamon of China" by the State Forestry Administration. Fangchenggang has a good foundation for the development of the cinnamon industry.

### **2.1.4 Convenient transportation**

In terms of the highway, Qinzhou-Fangchenggang Expressway runs through the whole territory and goes directly to the port. It is connected with the sea passage in the southwest and serves as the most convenient sea passage in southwest China. Qinzhou-to-Chongzuo Expressway also passes the territory of Shangsì of Fangchenggang. In terms of railway, in the area of Fangchenggang, there is the Nanning-Fangcheng Railway, which is connected with the national railway through the Nanning-Fangcheng Line Qinzhou-Beihai Line, Litang-Qingzhou Line, Nanning-Kunming Railway, Hunan-Guangxi Railway, etc. It takes about 1 hour and 15 minutes from Nanning to Fangchenggang. As for water transportation, Fangchenggang is one of the 12 main ports along the coast of China and the largest port in the west. There are 5 national ports in this city. The rapid development of various kinds of logistics and the rise of local logistics parks have created essential elements for the optimization and upgrading of the cinnamon industry in the city. Previously, due to the limited traffic conditions, the sales of cinnamon products have been hindered, but now the products can be shipped to markets around the world by virtue of developed transportation and logistics.

### **2.1.5 World-class cinnamon research and development technology**

Guangxi Gengyuan Spice Co., Ltd. in the city of Dongxing can extract natural benzaldehyde from cinnamon oil with the purity of 99.99%, which has become the main brand product of the company and has been recognized as the best natural benzaldehyde in the global market with an annual production capacity of 100 t, accounting for about one-third of the global output. Its annual output value is more than 50 million yuan. Besides, the product has passed international certifications such as KOSHER, HALAL, and FDA and as well as FSSC22000 and ISO22000 quality management system certification of SGS-CSTC Standards Technical Services Co. Ltd., one of the world's five authoritative certification bodies. The quality remains stable. It is recognized as the world's best quality natural benzaldehyde. Due to its popularity among customers, it is now in short supply.

## **2.2 Weakness analysis (W)**

### **2.2.1 Insufficient brand influence**

Cinnamon products have long been taken as spices and medicinal materials in Fangchenggang. They are only primary products that are simply dried and sold after being harvested, including cassia bark (Guipi), plate cinnamon (Bangui), quilled cinnamon (Guitong), etc. As most of the products are of primary level, very few of them are high-end products with intensive processing and extra values; it is difficult to give full play to the characteristic resource advantage of Fangchenggang's cinnamon. Although there are deep-processing enterprises such as Guangxi Gengyuan Spice Co., Ltd., which can produce high-end products such as natural benzaldehyde and cinnamaldehyde, other cinnamon processing factories (such as Shengde Chemical Fragrance Co., Ltd., Nasuo Fragrance Factory, etc.) only produce low value-added processing products such as cassia oil. Generally speaking, the deep processing capacity of cinnamon raw materials is far from enough, the industry extension is too small, the influence of product brand does not match the popularity of "hometown for cinnamon in China," and the resource advantage has not been transformed into a market advantage, which has affected the rapid development of the cinnamon industry. In particular, there is a lack of deep processing and leading high-end products in this city, and the industrial structure is not optimized, the regional development is not sufficient and balanced, representing a sluggish momentum.

### **2.2.2 Insufficient production and management, which is dominated by traditional small households**

At present, although there are some production and operation cooperatives in the city of Fangchenggang, the coverage is low. The vast majority of cinnamon farmers in Guangxi still carry out production and operation in the unit of traditional small households, resulting in insufficient information, low ability to resist market risks, and low technical level. The city should shift toward a development mode of modern agricultural industry characterized by professional production, clear division of labor, orderly interaction, and win-win cooperation.

### **2.2.3 Shortage of young workers**

When it is time to plant or harvest cinnamon, a large number of skilled labor workers are required. However, as wages rise, many young people choose to work in Guangdong province. In addition, due to the impact of Covid-19, temporary workers from Vietnam cannot enter the city. The aging of the rest of the labor force is getting serious, coupled with the relatively concentrated picking time, the shortage of labor force is inevitable, hindering the development of cinnamon to some extent.

### **2.2.4 Imperfect connection mechanism for the integration of cinnamon industry**

At present, the production scale of cinnamon processing in the city of Fangchenggang or even the whole region of Guangxi is relatively small. These enterprises do not play a strong driving role in the cinnamon industry and have a small share in the market. Most cinnamon products have too simple packaging and little marketing promotion, resulting in the low added-value of cinnamon products. In addition, the way for cinnamon farmers to participate in industrial integration is simple; most of the farmers are relying on contract farming that is interest-related and has low precision. The connection mechanism for industrial integration is not perfect, which makes it impossible to ensure the stable income increase of Guangxi's farmers in the process of cinnamon industrial integration. In the future, the connection mechanism will serve as the key link in the integration and development process of the cinnamon industry in Fangchenggang.

### **2.2.5 Moderate rural agricultural modernization and cooperative organization level**

At present, the standardization and scale of agricultural modernization and cooperatives for the cinnamon industry in rural areas of Fangchenggang are low. Through field investigation, we found that the main problems in cinnamon industry professional cooperatives in Fangchenggang are as follows. First, although some professional agricultural cooperatives have been basically completed, their popularity is not high, and professional agricultural cooperatives have not been established in many regions. Second, the establishment of cooperatives has been completed, while the internal management is in disorder. In particular, the profit mechanism related to farmers is not improved. As a result, many cinnamon farmers still choose to grow and sell cinnamon in families or small workshops. Third, the mode of building agricultural cooperatives in rural areas of Fangchenggang is still at the initial stage of exploration without enough experience and mature production techniques, leading to weak brand competitiveness.

## **2.3 Opportunities analysis (O)**

### **2.3.1 The market is expanding**

With the continuous development of the national economy, people's living standards are constantly improved, the value concept of consumers is also changing, their demand for health care products is rising year by year. Fangchenggang's cinnamon, which has been ranked as one of the four nourishing mountain treasures "Ginseng, Cervi Cornu Pantotrichum, Bird's Nest, and Cinnamon" since ancient times, has been favored by consumers and has a great market prospect. As important raw material in food, daily chemical, tobacco, medicine, feed, and other industries, the cinnamon spice has shown a good growth trend in recent years. According to Xinmin Evening News, flavors and fragrances are important upstream additives in food, daily necessities, cosmetics, and other fashion consumer industries. It has been applied in textile, material, and other fields. Just like "chip" to the IT industry, the high-tech content has become the main source of high added value and core competitiveness of the fashion consumer goods industry and has become well-known as "the aginomoto to light industry" and "chip to consumer goods." In 2020, the global market size of flavors and fragrances stood at nearly RMB 200 billion, with indirect driving benefits up to 10 times. Moreover, in Fangchenggang, cassia oil is further utilized to extract natural benzaldehyde. This has been a new technology to ensure that the purity of natural benzaldehyde can reach 99.99%, the best quality recognized in the world. Therefore, the natural benzaldehyde produced in Fangchenggang has been used as the "irreplaceable element" – the top aroma material for many top brand food, cosmetics, and medical supplies in the world. New applications of natural benzaldehyde continue to emerge, and the market demand is further expanding. The cinnamon industry has great opportunities for further development.

### **2.3.2 Extensive government support**

In January 2021, eight departments, including the Administration of Traditional Chinese Medicine of Guangxi Zhuang Autonomous Region, announced 10 kinds of Guangxi authentic medicinal materials, including cinnamon with good quality, curative effect, high popularity, and profound cultural heritage, with the purpose of promoting the integrated development of the primary, secondary and tertiary industries of Traditional Chinese medicine. Cinnamon is mentioned in the "Fangchenggang's Three-year Action Plan for Developing the City by Science and Technology (2021-2023)": the city will carry out the breeding of new varieties of cinnamon, speed up the construction of agricultural science and technology parks, and the implementation of rural industrial revitalization pilot projects, and accelerate the construction of Dongxing Cinnamon Spice Industrial Park. In 2020, Fangchenggang issued "Implementation Opinions on Promoting the Inheritance, Innovation, and Development of Traditional Chinese Medicine of the Ethnic Groups of Zhuang, Yao, and Jing." According to the opinions, the city will give its support to develop cinnamon and other characteristic species as tourism products of Fangchenggang. In August 2021, the "General Plan of Fangchenggang International Medical Open Experimental Zone" stated that the city would support the research and development of special medicinal, edible plants such as cinnamon and apply for geographical indication protection. China also strongly supports the development of the cinnamon industry. In February 2022, Guangxi issued "the Three-year Action Plan for The Revitalization of the Agricultural Industry in Guangxi Zhuang Autonomous Region (2021-2023)". According to the plan, the autonomous region will maintain fiscal cohesion

to promote the overall stability of rural revitalization subsidies and an allocation of no less than 50% of the funds for industrial development to promote the integrated development of the primary, secondary and tertiary industries. The plan proposes to build a carrier of integrated industrial development to enhance the cohesion of industrial development.

### ***2.3.3 Health preservation and ecological tourism are developing continuously***

Fangchenggang has many islands, bays, and beaches. With these characteristics, "the sea is in the city, and the city is in the sea." Enjoying the friendly ecology, favorable climate, and sound environment, the people here are in good health and long-lived. Therefore, the city was named "the Capital of Oxygen in China," "the Hometown for Golden Camellia in China," "the Homeland for Egrets in China," and "The Hometown of Longevity in China" by national authorities. It is also a full-sea-view ecological bay suitable for living, doing business, and traveling in the Beibu Gulf Zone. The uniqueness of Fangchenggang's tourism products attracts the attention of tourists from home and abroad. As the city possesses such superior ecological environment, natural resources, and profound cultural heritage, and Fangcheng district and Dongxing city are the hometowns of longevity in China, the development of traditional Chinese medicine industry can not only integrate and promote each other with the culture of health preservation and longevity, but also add new highlights to leisure and sightseeing tourism in Fangchenggang, and further protect and optimize the ecological environment, and thus form new regional competitive advantages. To further develop the integrated cinnamon industry in the city of Fangchenggang, it is natural to rely on the impetus of cinnamon processing enterprises and the tourism industry. The steady and rapid development of the tourism industry in Fangchenggang is an important opportunity for the development of the cinnamon industry.

## ***2.4 Threats analysis (T)***

### ***2.4.1 Competition of the same industry in different regions***

As a major competitor of cinnamon industry development in Fangchenggang, Luoding cinnamon in Guangdong province also has its unique geographical location and natural resources, and Luoding city is also the hometown of cinnamon in China. Besides, the governments of Guangdong province and Luoding give great support to the city to develop the cinnamon industry by introducing multiple policies supporting and benefiting agriculture, for example, development policies to encourage small and medium-sized enterprises and deploying technologies of processing and cultivation. In recent years, the planting area of cinnamon in local areas expanded rapidly. The deep processing industry had been further developed, with a lot of cinnamon products being launched. The brand of Luoding Cinnamon gradually formed. All these factors, coupled with the geographical advantages of Guangdong province, greatly affected the development of Fangchenggang's cinnamon industry and those in other regions across the country. At the same time, the development of the cinnamon industry in Fangchenggang is at a bottleneck stage, which is mainly reflected in the lack of high-tech enterprises and intensive processing, resulting in low added value and weak brand influence of the cinnamon industry.

### ***2.4.2 Weak driving force and competitiveness of leading high-tech enterprises***

The driving force of leading high-tech enterprises can not only improve the competitiveness of products but also quickly promote the healthy development of the cinnamon industry. However, due to the limitations of regional development and the lack of foreign-invested enterprises and scientific research institutions, there are few leading enterprises in the intensive processing of the cinnamon industry in Fangchenggang. At present, there is only one enterprise -- Guangxi Gengyuan Spice Co., Ltd. in Dongxing city across the whole city of Fangchenggang, and the production has not yet formed a large scale. Besides, the industrial chain of cinnamon in Fangchenggang is not mature and not closely related to cinnamon households; this also restricts the development of cinnamon enterprises. Therefore, Fangchenggang should actively take measures to promote the development of leading enterprises and strengthen the relationship with farmers so as to extend the cinnamon industrial chain and increase the added value of the cinnamon industry.

## ***3. Countermeasures for the integrated development of the cinnamon industry in Fangchenggang***

### ***3.1 Extend the industrial chain and realize the integration of the primary, secondary and tertiary industries***

Fangchenggang should stimulate the cinnamon industry to play an active role in major construction projects of Fangchenggang International Medical Opening-up Pilot Zone and actively develop deep processing and increase the added value of products. It should update and change the previous model of cinnamon products and launch more popular products such as plate cinnamon (Bangui) and quilled cinnamon (Guitong) according to the demand of the market. It should introduce deep processing enterprises, vigorously develop high-quality cassia core strips (Yanzaigui), develop deep processing products such as natural benzaldehyde and cinnamaldehyde on the basis of initial processing of cassia oil, and improve the added value of products. It should take advantage of the unique resources of Fangchenggang as one of the three spice bases in China and the main supplier of cinnamon origin protection products (geographical indication products) and build an exclusive Fangchenggang cinnamon brand and form a brand effect.

### ***3.2 Attach great importance to brand building***

Fangchenggang should take advantage of being one of the three major spice bases in China, take Fangchenggang cinnamon with "national geographic indication protection" as the brand position, vigorously promote the "three products and one standard"

certifications, and apply for the registration of independent property rights trademarks. It should cultivate well-known brands, set up a special logo to increase market awareness and expand the industry influence and product popularity through investment attraction cooperation, market cultivation, and publicity, and build demonstration area into a leading force for flavor and fragrance industry with obvious advantages and obvious brand benefits.

### **3.3 Optimize the structure of practitioners and strengthen training for cinnamon farmers**

Facing the problems of serious aging and the low educational level of cinnamon practitioners in the cinnamon industry in Fangchenggang, the structure of the workforce should be optimized. The city should take relevant measures to benefit farmers and attract young and middle-aged people to engage in the cinnamon industry, encourage college students studying abroad and veterans to return to their hometowns to start businesses and build beautiful hometowns. Besides, the city should invite technical experts in cinnamon cultivation and product research and development and rural science and technology commissioners to natural villages to give lectures and training on cinnamon cultivation, processing, and marketing.

### **3.4 Develop a number of regional leading enterprises to guide the development and innovation of the cinnamon industry together with farmers**

There is only one leading cinnamon enterprise in Fangchenggang, and the driving force is far from enough. In view of these problems, we suggest that the government of Fangchenggang should give more support to leading enterprises and build and develop more leading enterprises. The city should give full play to the leading role of enterprises in the industrial chain and cooperate with farmers' cooperatives, family farms, households, and various entities in the whole industrial chain engage in agricultural technology research and development, storage, transportation and sales, brand circulation, and comprehensive services, to jointly develop superior and distinctive resources and optimize the allocation of innovative elements. Furthermore, the city should guide cinnamon farmers to directly or indirectly invest in leading enterprises with land management rights, labor, capital, facilities, or other elements, and establish a cooperation mechanism of accurate assessment, risk-sharing, and benefit-sharing on the basis of protecting the basic rights and interests of farmers.

### **3.5 Improve the benefit coupling mechanism between farmers and enterprises**

The government should actively promote a benefit coupling mechanism that satisfies cinnamon farmers and the government, allowing farmers and enterprises to learn from each other through demonstration models. Besides, the government should give certain financial subsidies to cinnamon enterprises in line with requirements, improve the satisfaction of cinnamon farmers and encourage them to participate in the production management of cinnamon enterprises in various ways. Finally, the government should build a more stable and connected organization with the cinnamon industry association as the intermediary organization, cinnamon leading enterprises as the core, farmers and family farms as the main participants.

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## **References**

- [1] Guangxi Cinnamon (2008) Recognized as Product with National Geographical Indication [J]. *Friends of the Farm Family (Theory Edition)* (09): 71.
- [2] Research Group of The Academy of Macroeconomic Research and The Department of Rural Economy, National Development and Reform Commission (2016). Research on Promoting the Integration of the Primary, Secondary, and Tertiary Industries in Rural Areas. *Review of Economic Research*, (4): 3-28.
- [3] Xiao W, and Du Z. (2019). Integration of the Primary, Secondary, and Tertiary Industries in Rural Areas: Connotation, Current Situation and Clues for Future Development. *Journal of Northwest A&F University (Social Science Edition)*, 19(6): 120-129.