

Analysis on construction of the Supply Chain and Brand of Guangxi Characteristic Economic Agricultural Products—A Case Study of Guilin, China

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Abstract Firstly, it is briefly introduced that Guangxi characteristic economic agricultural products are currently characterized by typical regional features and strong competitiveness. Then, Guilin is taken as an example, the problems existing in constructing the supply chain and brand of Guilin characteristic economic agricultural products are pointed out after the analysis of its current situations, the problems include weak agricultural production infrastructure, weak deep products processing capacity, low modernization level of storage and transportation as well as short of fixed marketing channels; meanwhile, brand construction faces the problems of little top brands and few differentiated products. Finally, some measures are proposed to solve these problems from the perspectives of establishing the management idea of agricultural products supply chain and enhancing the awareness to protect agricultural products brand, it is also suggested that these measures be extended to the whole Guangxi autonomous region in order to explore the way of the development of Guangxi characteristic agriculture.

Key words Guangxi, Characteristic economic agricultural products, Brand, Supply chain, China

With China's rapid economic growth, continuous improvement of people's incomes and growing safety and healthy consciousness, the residents' consumption concept has shifted from the previous subsistence consumption to the health-based consumption. In order to meet people's health needs, the quality and safety of agricultural products should be guaranteed during the whole production, processing and marketing process so that the quality and safety information of agricultural products could be traced. From this point, the management mode of supply chain is the best option. While the brand construction of agricultural products has become an important means of current agricultural products production and management, agricultural products brand is built based on the construction of the supply chain of agricultural products so that they could promote each other and rely on each other and promote rural economic development.

1 Brief introduction of Guangxi characteristic economic agricultural products

1.1 Concept of characteristic economic agricultural products The "characteristic" in characteristic economic agricultural products refers to the effect, function and result other agricultural products do not have in the consumption of agricultural products, such as "natural sweetener" in *Fructus momordicae* and its unique role in health care^[1]; what's more, "characteristic" also refers to the regional products with unique quality advantages which are gradually becoming famous for the public praise of the feelings and service they provide under the long-

term market mechanisms, such as "Lifu taro", "Shatian pomelo" and so on. The "economic" in characteristic economic agricultural products means that characteristic agricultural products generally have higher market value than other agricultural products because of its uniqueness. The industries related to characteristic economic agricultural products have more obvious geographical and resources advantages as well as market prospects than that related to other agricultural products in certain regions.

1.2 Features of characteristic economic agricultural products

1.2.1 Typical regional features. Characteristic economic agricultural products are produced with specific regional resources and confined to specific regions as well as face specific market. This shows that the production regions of characteristic economic agricultural products enjoy certain advantages of natural resources, which will form some entry barriers for certain operators and maintain the operators in production regions with good economic benefit. For example, although there are *Fructus momordicae* in Guangdong, Guangxi, Hunan and other provinces, Yongfu County, Guilin is the birthplace and main producing area of the authentic *Fructus momordicae*, it has more than 200-year history of planting and a complete set of mature planting and processing technology as well as certain advantages in both quality and size.

1.2.2 Strong market competitiveness. Characteristic economic agricultural products are generally famous, excellent and special agricultural products with high added value, they are very popular in the market, which makes the industrialization development of their production and scale economy possible. Characteristic agricultural products industries are technology, capital and labor-intensive industries, characteristic agricultural products have higher input-output ratio and better economic

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benefits than general crops. To promote the industrialization development of characteristic economic agricultural products and establish a sound supply chain of agricultural products not only create lots of job opportunities, absorb rural surplus labor forces and increase their income, but also boost the development of tourism, business, transportation and other industries. This is also the only way for agricultural and rural economic development under new circumstances.

1.3 Current situation of Guangxi characteristic economic agricultural products Guangxi has climatic conditions suitable for the growth of subtropical plants, rich agricultural resources, rich variety and large output of characteristic economic agricultural products; in addition to the *Fructus momordicae*, Lifu taro and Shatian pomelo in Guilin, there are also other characteristic economic agricultural products, such as Rongshui rice pomelo, Guangxi cinnamon, Nandan Yao chicken, Nandan Baping rice, Bama pigs, Wuzhou sausage and so on. But the current development of Guangxi characteristic economic agricultural products is very backward, the production and management of characteristic economic agricultural products can not satisfy the new needs for characteristic economic agricultural products to meet the improvement of the income and life quality of urban and rural resident. The family producing is very popular in the rural areas of Guangxi, its commercialization degree of characteristic economic agricultural products is low, construction of production bases is backward and it is lack of leading enterprises and cooperation between farmers and enterprises, the construction of the supply chain of characteristic economic agricultural products is backward. There are few characteristic agricultural products brands and well-known brands, the overall competitiveness of brands is not strong.

2 Current situations of Guilin supply chain of characteristic economic agricultural products and brand construction

2.1 Current situations of Guilin characteristic economic agricultural products Guilin characteristic economic agricultural products have relative high competitiveness in international market, the main export varieties include *Fructus momordicae*,

Wenzhou oranges, ponkan, Shatian pomelo, persimmon products, ginkgo, Lifu taro, water chestnut, summer and autumn tomatoes and so on. Yongfu County, Guilin was named as "the hometown of China's *Fructus momordicae*" by the Ministry of Agriculture in 1995, Yongfu County was named as "origin of *Fructus momordicae*" in 2004. Gongcheng County was granted as "hometown of Chinese ponkan" by the hometown naming group of Chinese special products in 1996; Yangsuo and Pingyue County are entitled with "hometown of Chinese Shatian pomelo"; Lifu taro won the national certification mark in 2000 and became brand products in China International Expo in 2001. Some well-known agricultural production and processing enterprises, such as Beijing Huiyuan, Jiangsu Yurun, Guangdong wens and so on, have settled down in Guilin.

According to the standards of modern agriculture and the "index system of agricultural modernization" formulated by the Rural Economy Research Center of the Ministry of Agriculture, ten quantitative criteria are proposed as follows: (1) per capita GDP (X_1); (2) per capita net peasant income (X_2); (3) the proportion of agricultural and social employment (X_3); (4) rate of scientific and technological contribution (X_4); (5) agricultural mechanization level (X_5); (6) the proportion of employees with middle school education and above (X_6); (7) per capita GDP of agricultural labor (X_7); (8) per capita amount of agricultural products production of agricultural labor (grain equivalent) (X_8); (9) agricultural output value per hectare cultivated lands (X_9); (10) coverage rate of forest (X_{10}). All indexes in Guilin are shown in Table 1.

As seen from Table 1, the four modernization indexes in Guilin, including per capita GDP, agricultural output value per hectare cultivated lands, agricultural mechanization level and coverage rate of forest, have reached the implementation stage, but the per capita net peasant income, the proportion of agricultural and social employment, the rate of scientific and technological contribution, the proportion of employees with middle school education and above, per capita GDP of agricultural labor and per capita amount of agricultural products production of agricultural labor are still at the initial stage, the overall level of agricultural modernization is not high.

Table 1 Agricultural modernization indexes in Guilin

	External conditions indexes of agriculture			Self-conditions indexes of agriculture			Indexes of agricultural production effects			
	X_1 //yuan	X_2 //yuan	X_3 //%	X_4 //%	X_5 //%	X_6 //%	X_7 //yuan	X_8 //t	X_9 //yuan	X_{10} //%
Standard at initial stage	5 600	3 000	40	45	40	55	4 200	3	17 500	15
Standard at implementation stage	10 500	6 000	20	60	60	70	7 000	6	35 000	20
Present situations of Guilin(2006)	10 724	3 391	55	50	63	62	5 082	3.4	37 380	67

By the end of 2006, Guilin has built 402 leading processing, planting and breeding as well as circulation enterprises of agricultural industrialization which have certain scale and obvious radiating drive role, it also organizes 540 standardized farmers' specialized cooperative economic organizations which have certain scale and stronger promotion capacity. The leading enterprises of agricultural industrialization in Guilin process and sell 610 000 tons of local agricultural products, accounting

for 18% of the total export amount of agricultural products and making a sales income of 5.3 billion. Leading enterprises and farmers' specialized cooperative economic organizations directly drive 330 000 rural households and radiate 260 000 rural households, totally accounting for 53.5% of the total rural households. The development pattern with the interaction between enterprises and farmers as well as all leading enterprises-led agricultural industries has basically taken their shapes. In re-

cent years, Guilin formulates and implements Production Technology Regulation on non-harmful agricultural products about vegetables, fruits, *Fructus momordicae* and so on, it also establishes a number of pollution-free and green food production bases. By the end of 2006, there are 71 agricultural products in Guilin city granted by the Ministry of Agriculture with the right to use the "pollution-free" mark and 43 products in 6 enterprises entitled with the use right of "green food" mark. Since 2003, Guilin formulates and implements *The Regional Distribution and Development Plan of Guilin Superior Agricultural products and Regional Characteristic Agricultural Products (2004 – 2010)*, under the incentives of a series of policy measures, the scale agricultural products base and industrial belt supported by the superior and special agricultural products are quickly formed, which lays the initial industrial foundation for the development of modern agriculture.

2.2 The relationship between supply chain and brand construction The supply chain of agricultural products connects each link from the production to the sales of agricultural products and relates to all participating subjects before, during and after the production of agricultural products. The quality of agricultural products and their processed products could not be completed and guaranteed by a single household or single enterprise, instead, it is completed by the participates in each node of the entire agricultural supply chain^[2]. If the real sense of agricultural supply chain could be established, quality of agricultural products could be well solved. Quality of agricultural products is the basis of brand construction of agricultural products, without high quality, even if the brand is constructed, its products will not last in the market. In consideration of the overall interests, during the production and processing process of agricultural products, it is required that the farmers, processing enterprises and retailers in each node of the entire supply chain should comply with uniform quality standards and formulate the standards of each link according to uniform standards. Brand construction is based on quality and the quality of agricultural products is based on the construction of supply chain, thus forming a virtuous circle of interaction, which can be shown in Fig. 1.

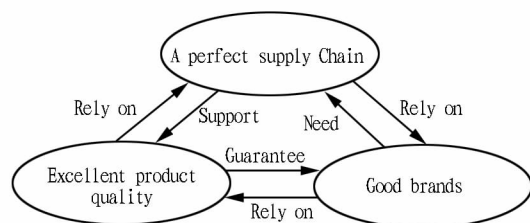


Fig. 1 Supply Chain and Brand Cyclic Graph

Traditional agricultural products logistics is operated by scattered members, but in the supply chain the upstream and downstream enterprises are integrated as a whole, they cooperate mutually and share information so as to improve the rapid response capability of logistics^[3]. The backward development of agricultural supply chain will lead to the low quality of agricultural products and lagged standard system, which will affect the construction of agricultural brands.

3 The problems existing in constructing the supply chain and brand of Guilin characteristic economic agricultural products

3.1 Problems in the construction of agricultural supply chain

3.1.1 Weak agricultural production infrastructure. It should not be ignored of the impact of obsolete agricultural infrastructure, delayed construction, natural disasters and plant diseases on the steady development of agriculture. The construction of farmland irrigation facilities in Guilin is backward, a considerable portion of current irrigation facilities have already exceeded the required service life, which are obsolete with serious disrepair and have unfitted facilities and declining benefit. 317 of 418 reservoirs have different degrees of hidden dangers, 165 belong to III category of dangerous reservoirs.

3.1.2 Weak capacity to conduct deep processing. Let's take *fructus momordicae* as example, although American and Japanese scientists have separated non-sugar sweetener which is 300 times sweeter than sugar cane from *fructus momordicae*, earning it a world reputation for its "natural sweetener" and making it popular goods purchased by foreigners at Guangzhou export trade fair, there are only some bio-pharmaceutical companies in Guilin using *fructus momordicae* as main ingredients such as Layn Natural Ingredients and Jiqi Natural Products Science and Technology Co. Ltd which have formed industrial scale, the annual consumption of *fructus momordicae* is very limited and the *fructus momordicae* in the market are mainly sold without being processed. Compared to the one Yuan sales price of unprocessed *fructus momordicae*, the 18 Yuan per box of its granule will have more market advantages in long term. In addition, nearly all "Shatian pomelo" in the market are sold in its natural form, the author hasn't found any of its processed products.

3.1.3 Low modernization level of storage and transportation. Those seasonal fruits such as "Rong County Shatian pomelo" have high nutritional value and excellent taste, so they always sell good, but it could make better market benefit if they could be stored until slack season to fill the market gaps. It is discovered that the fruit growers still use traditional storage methods by putting them in bamboo basket, cellars and vacant rooms and so on. Developed countries generally use the standard circulation methods of large agricultural logistics centers, which go through the process of pre-cooling, cleaning, disinfection, grading, packaging and refrigeration. However, the current Guilin agricultural logistics center is basically at the agricultural market level, both its software and hardware facilities need to be improved. Transportation of agricultural products is mainly rail and road transportation under normal temperature.

3.1.4 Short of fixed marketing channels. Most fruit farmers are small and individual producers, small peddlers are still the main market participants, they do not have their own fixed marketing organizations and lack in market information. Most farmers still use traditional passive marketing methods, waiting for the customers coming or even setting up a stall nearby. As a result, although with the same or even better quality, their products sell at a price several times lower than that in the su-

permarket, their marketing methods are quite passive.

3.2 Problems in brand construction

3.2.1 Lots of brands but few top brands. Till now, there are 71 agricultural products in Guilin City granted by the Ministry of Agriculture with the right to use the "pollution-free" mark and 43 products in 6 enterprises entitled with the use right of "green food" mark. However, there are only quite few well-known brands like "fructus momordicae" in Yongfu, "Lifu taro" in Lifu, and "Shatian pomelo" in Rong County. Because of the lack of well-known local top brands, lots of characteristic economic agricultural products with high quality are only sold as raw materials and intermediate products, which affects the price and farmers' income.

3.2.2 Lots of similar products but few differentiated products. Although with better quality, Products of the same type which have registered a trademark or even been granted famous provincial brand products do not have typical characteristics, they are all similar in their processing, brand name, packaging and promotion, which leads to the vicious competition among the same type products at the same region. For example, the processed products using "Lifu taro" as the main material are with "Jinshunchang", "Shunchang", "Lijiang" and other brand names, as a result, various brands contain each other, which makes it unable to form a whole advantage.

4 Some measures to solve problems in constructing the supply chain and brand of characteristic economic agricultural products

4.1 Establishing the management idea of agricultural products supply chain

4.1.1 Strengthening the agricultural production infrastructure and establishing standardized production concept. Facilities and equipments are not only an important symbol of modern agriculture, but also a weak link in the agricultural development process, the agriculture-supporting project and special funds should be mainly invested in rural water, electricity, roads, biogas and standard fields and other farmers' most concerned, most urgently needed and most direct production and living facilities. To formulate and implement unified production standards in the production process will promote the rapid extension of agricultural scientific and technological achievements. The production standard should be set from the aspects of seeds, pesticides and fertilizers according to national standards.

4.1.2 Establishing a management model of agricultural industrial chain led by farmers cooperative organizations and leading enterprises. Agricultural brand construction and agricultural industrial chain appear concomitantly and depend on each other, without strong industrial base, there can be no scale; without famous brand construction, the industrial chain can not be bigger and stronger. Only by combining the brand development and industrial chain together can the benefit emerge and added value be improved. According to the characteristics of Guangxi agricultural industry, some leading enterprises with strong traction force should be cultivated and constructed to play a leading role within the industry. A cooperative operation mechanism be-

tween leading enterprises and farmers cooperative organizations is established and a management model of agricultural industrial chain combining leading enterprises, bases and farmers together is adopted, with the leading enterprises, professional cooperative organizations and associations as carriers, it should put great time and effort in body construction and to improve the industrial scale as well as product quality, it should also give full play to their respective roles and constantly promote the development of agricultural brands.

4.2 Enhancing the awareness to protect agricultural products brand

4.2.1 Constructing agricultural production base and developing characteristic economic agricultural products industry. The construction of agricultural production base is also important conditions to implement agricultural industrialization and create regional agricultural brands. While to create regional agricultural brands needs large-scale and high-quality agricultural production base, especially the production base of characteristic agricultural products, it needs to clearly recognize the superior agricultural products of each region and the regional distribution and development planning of characteristic agricultural products. In order to develop characteristic economic agricultural products industry, the features of differentiation and scarcity should be transformed into brand advantages. Brand construction can promote regional distribution of agricultural products, the construction of scale planting base and specialized production, the construction of characteristic agricultural products base and other agricultural products base can boost the market value of agricultural products, and thus form a virtuous cycle of industrial development of characteristic economic agricultural products.

4.2.2 Conducting integrated marketing of agricultural brands by virtue of various platforms. Taking the advantage of its status as the host of ASEAN EXPO, Guilin can promote and extend the regional brands of agricultural products through the Agricultural Fair, Agricultural products trade forum, investment inviting meetings and other forms; it should take full advantage of those platforms with international influence, such as "March 3" Folk Song Festival, "Impression Liu Sanjie" and "Dream Lijiang" to conduct integrated marketing of agricultural products^[4].

4.2.3 Carrying out the protection of geographical trademarks so as to escort characteristic economic agricultural products. The agricultural products with geographical certification trademarks are proved to be with significant regional characteristics, the successful registration of geographical certification trademarks will promote the development of the whole industry and get the people rich. However, too many registered trademarks of the same type of products in the same area will result in a confused knowledge of each brand and a loss of unique characteristics. Therefore, it is the government's unavoidable duty to enhance the protection of the products with geographical trademarks and improve the reputation of characteristic economic agricultural products brands.

4.3 Constructing the supply chain and brand of Guangxi characteristic economic agricultural products

The problems in constructing the supply chain and brand of characteristic

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lation and verified regional conditions in Yunnan Province, in the vast mountainous areas (especially in remote alpine mountain), there are still a certain number of people who are difficult to achieve the initial well-off food consumption standard.

From a higher perspective, to adhere to the "red line" of 5.9 million hm² farmlands is the need to ensure the economic and social safety of Yunnan Province and sustainable development of people of all nationalities. Meanwhile, the land resources are the most important basic resources in the whole sustainable development system, if the "red line" of land resources to ensure food security is broken through, the whole sustainable development system will shift to uncoordinated state and even develop towards the "vicious circle" direction. Therefore, in order to maintain the economic and social security of the whole Yunnan Province as well as the sustainable development of ethnic minority people, the "red line" of 5.9 million hm² farmlands in the whole province should be strictly stuck to.

References

[1] YANG ZS, LIU YS, ZHAO QG, *et al.* Principles and methods of regional food security assessment based on cultivated land use and its application in Yunnan[M]. Beijing: China Science and Technology Press, 2008. (in Chinese).
 [2] FU SB, WANG HH, MA Q. Quantitative analysis of dynamic change of cultivated land pressure in arid and semi-arid region based on food security[J]. Journal of Anhui Agricultural Sciences, 2010, 38(1):544-547. (in Chinese).
 [3] HE YM, YANG ZS, ZHAO QG, *et al.* Study on the red line of farm-

land area for ensuring food security of mountainous area in China and the countermeasures system[J]. Journal of Anhui Agricultural Sciences, 2009, 37(3):1345-1349. (in Chinese).
 [4] YANG ZS, LI YH, ZOU Z, *et al.* Exploitation and utilization planning of the land resources in Yunnan Province of China western development[M]. Kunming: Yunnan Science and Technology Press, 2003: 13-256. (in Chinese).
 [5] Yunnan Bureau of Statistics. Yunnan statistical yearbook-2009[M]. Beijing: China Statistics Press, 2009. (in Chinese).
 [6] Chinese Academy of Agricultural Sciences. 400 kilogrammes of grain per capita are essential to China[J]. Scientia Agricultura Sinica, 1986, 19(5):1-7. (in Chinese).
 [7] Chinese Academy of Agricultural Sciences. 400 kilogrammes of grain per capita are essential to China[J]. Journal of Agrotechnical Economics, 1986(8):12-15. (in Chinese).
 [8] Chinese Academy of Agricultural Sciences. Re-discussion on 400 kilogrammes of grain per capita are essential to China[J]. Science & Technology Progress and Policy, 1991, 8(4):31-32. (in Chinese).
 [9] LIU ZW. The food security issues in China[J]. Issues in Agricultural Economy, 2004, 25(12):8-13. (in Chinese).
 [10] State Council Information Office of the People's Republic of China. White paper on China's grain problem[N]. People's Daily, 1996-10-25(2). (in Chinese).
 [11] CPC Yunnan Provincial Committee. The proposals of CPC Yunnan Provincial Committee on the Eleventh Five-Year Plan of the development of Yunnan provincial economy and society[C]. Kunming: Yunnan People's Publishing House, 2007: 1-21. (in Chinese).
 [12] The State Council of the People's Republic of China. Outline of the national overall planning on land use (2006-2020)[N]. People's Daily, 2008-10-24(13-15). (in Chinese).

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economic agricultural products in Guilin are typical in that of the whole Guangxi Province, its experiences accumulated in the construction process could provide certain references and guidance for the construction of the supply chain and brand of characteristic economic agricultural products in Guangxi, taking it for reference, the government can take appropriate measures to promote rural economic development in Guangxi and improve the farmers' incomes.

5 Conclusions

The construction of the supply chain and brand of characteristic agricultural products is a systematic engineering, it cannot be completed by a single farmer, enterprise or vendor, nor by a single collective or department, it needs the support and guidance of relevant government departments. Currently, the problems in constructing the supply chain and brands of Guangxi characteristic economic agricultural products, such as that existing in the integrated marketing of the supply chain, the management and protection of the geographical marks of the brands and the cultural integration of regional brands and so on, still need to be solved, which will become a new research topic on the production and develop-

ment of Guangxi characteristic economic agriculture.

References

[1] CAO Y. Promoting competitive ability of farm products through establishing regional brand[J]. Research of Agricultural Modernization, 2007(1):69-71. (in Chinese).
 [2] TAN T, ZHU YH. Research on the organizing mode of agricultural products supply-chain[J]. Modern Economic Research, 2004(5): 24-27. (in Chinese).
 [3] BAI G, MA GZ. China should follow the way of agriculture brands [M]. Beijing:China Economy Press, 2006. (in Chinese).
 [4] WANG Y. On regional brand construction of Guangxi agricultural products[J]. Consume Guide, 2008(1):37-38. (in Chinese).
 [5] XIAO SW. Early-warning mechanism of food security[J]. Asian Agriculture Research, 2009, 1(8):35-39.
 [6] WANG Q, CHEN ZG, ZHOU JC. Study on the standard and allocation scheme for farmland preservation compensation[J]. Journal of Anhui Agricultural Sciences, 2009, 37(36):524-526, 537. (in Chinese).
 [7] HE YF, MA CQ, YANG HJ. Food security based on the spatial temporal feature of grain production[J]. Asian Agricultural Research, 2009, 1(1): 9-13.
 [8] YUE K, YANG XH, LIANG S. The evaluation and countermeasure of the food security situation in Hebei Province[J]. Journal of Anhui Agricultural Sciences, 2009, 37(6):415-416, 460. (in Chinese).