

EVALUATING REGIONAL AGRICULTURAL PRODUCT BRANDS: EVIDENCE FROM MAOMING LITCHI REGIONAL BRAND

XiaoPing Tan*, HuaWan Zhong, LiXia Zhang, YingYing Shen
Guangdong University of Finance & Economics, Guangzhou 510320, Guangdong, China.
*Corresponding Author: XiaoPing Tan

Abstract: Regional agricultural brands are a special type of brand. Due to their unique geographical attributes, stringent quality standards, and high market recognition, they can generate greater brand premiums for the corresponding agricultural products compared to non-branded and drive local economic development. As a result, regional agricultural brand strategies have become an important tool for many countries (and regions) to promote rural development. This study analyzes the connotation of regional agricultural brand value, examines the components and influencing factors of brand value, constructs a model for evaluating agricultural product brand value, and applies the model using the Maoming litchi regional brand as a case study, aiming to advance the development of regional agricultural brands through evaluation-driven improvement.

Keywords: Regional agricultural brands; Brand value evaluation; Geographical indications; Agricultural branding; Maoming litchi

1 INTRODUCTION

When a geographical name acquires widespread recognition, favorable reputation, and strong distinctiveness comparable to that of a product or service brand, it can be regarded as a *regional brand*. A regional agricultural product brand refers specifically to a regional brand that takes agricultural products and related agricultural industries as its core carrier. The construction of such brands has increasingly been viewed as an effective mechanism for reducing agricultural market risks, increasing farmers' incomes, and promoting sustainable rural development.

In China, *regional agricultural brand development has been elevated to the level of national strategy*. Since the issuance of *<Opinions on accelerating the development of modern agriculture and further enhancing the vitality of rural development>* in 2013, which first emphasized the need to strengthen agricultural product branding, a series of policy initiatives have followed. These include the *Notice on Implementing the Strategy of Revitalizing Agriculture through Quality* (2018), the *Opinions on Accelerating the Development of Strong Agricultural Brands* (2018), and the *Opinions on Strengthening the Protection of Geographical Indications for Agricultural Products and Creating Regional Public Brands* (2019). According to the *Agricultural Brand Excellence Cultivation Plan (2022–2025)*, 82 regional public brands were incorporated into the national cultivation list in 2024. Collectively, these policies highlight the government's intention to enhance agricultural competitiveness through branding, quality improvement, and institutional support.

Against this background, the present study focuses on the valuation of regional agricultural product brands. By clarifying the connotation and structure of brand value, constructing a quantitative evaluation model, and applying it to the Maoming litchi regional brand, this research aims to provide both theoretical insights and practical guidance for regional agricultural brand development.

2 THE COMPOSITION AND DETERMINANTS OF REGIONAL AGRICULTURAL BRAND VALUE

2.1 The Concept of Regional Agricultural Brand Value

A brand is a name, term, design, symbol, or any other feature that identifies one seller's goods or service as distinct from those of other sellers [1]. Subsequent studies have emphasized that brand value is a multidimensional construct encompassing quality, service, innovation, tangible assets, and intangible assets [2]. Regional branding can be viewed as an extension of corporate branding theory, with the branding of a specific region (such as a city or region) representing a natural extension of corporate branding theory [3]. The value of a regional brand is closely tied to the geographical and cultural factors of its location. Agricultural production is highly correlated with the region, and numerous well-known agricultural product brands have registered geographical indication certification marks or have been recognized as geographical indication protected products. This grants them protection under relevant intellectual property laws, providing more avenues for regional brand protection and capitalization.

2.2 Sources of Regional Agricultural Product Brand Value

2.2.1 Industrial cluster branding

Regional agricultural brands often emerge from localized industrial clusters. Such clusters represent concentrations of specialized producers, shared resources, and collective reputations built over time. Cluster-based branding enhances competitiveness by differentiating products in markets with by information asymmetry and intense competition. Empirical evidence from China shows that many well-known regional brands—formed around agricultural or agro-processing clusters have become closely associated with regional identities and economic performance. Cluster branding performs several key functions: attracting investment and skilled labor, fostering collective action among stakeholders, and facilitating coordinated marketing and innovation activities.

2.2.2 Destination branding and agritourism

Another important source of regional agricultural brand value is destination branding, particularly through the integration of agriculture and tourism. Destination image has long been recognized as a critical determinant of tourist behavior. In agricultural regions, the development of agritourism, experiential consumption, and educational activities transforms production areas into multifunctional destinations.

High-quality agricultural products, distinctive rural landscapes, cultural heritage, and tourism services jointly shape a unified destination image. This integration enhances consumers' emotional attachment to the region and strengthens brand value beyond the product itself.

2.3 Components and Determinants of Brand Value

2.3.1 Components of regional brand value

David A. Aaker proposed the "Five-Star" model of brand equity, arguing that brand equity consists of five components: brand awareness, brand perceived quality, brand associations, brand loyalty, and other proprietary brand assets [4]. Kevin Lane Keller proposed the Customer-Based Brand Equity (CBBE) model, suggesting that brand equity originates from brand knowledge, which in turn comprises two components: brand awareness and brand image [5]. Dr. Yoshikuni Hirose et al. argued that price advantage, loyalty, and expansion capability are the three main drivers of brand value in their brand value evaluation model (the HIROSE model [6]. Sun Yuling and Yan Feng divided the value of regional public agricultural brands into four parts: social public value, regional economic value, brand management value, and brand cultural value [7]. Cheng Hong et al. pointed out that the value of regional public brands consists of the brand reputation and impression formed by the region's high-quality products, the growth in transaction scale and the status as a regional trading center brought by premium product sales, the public interest generated by the agglomeration of relevant factor resources driving industrial development, and innovation-driven development along with institutional safeguards [8].

2.3.2 Factors influencing regional agricultural brand value

In 2018, the State Administration for Market Regulation of China issued the standard Regional Brand Value Evaluation-Geographical Indication Products, which evaluates brand strength from the perspectives of intangible factors, quality, service, and protection innovation. Liu Siyu conducted an empirical analysis of fruit products in Shandong Province and found that orchard area has a significant positive impact on the value of regional public fruit brands, while the effective irrigation rate also has a positive effect [9]. Wang Xing argued that agricultural product quality, website service quality, regional associations, brand awareness, and advertising are fundamental factors influencing consumer emotions and brand loyalty toward branded agricultural products based on the SOR theory [10]. Wang Yihua, in a study on geographical indication agricultural product brands in Yunnan Province, identified nine factors—including product quality, market demand, implementation of agricultural standardization, brand marketing factors, and geographical environment—that play important roles in the development of regional brands [11]. Tan Xiaoping et al. drew on corporate brand value evaluation models to study how to reasonably evaluate the value of geographical indication brands, using the Fenghuang Dancong geographical indication as a case study [12].

3 APPROACHES TO REGIONAL BRAND EVALUATION

3.1 Traditional Asset Valuation Methods

Regional brands share many similarities with corporate brands in terms of brand design, operation, and management. Therefore, the income approach, a traditional method for valuing corporate intangible assets, can be used for evaluation. According to the basic logic of the income approach, the value of a regional brand is measured by discounting the incremental income generated by the regional brand to its present value at the evaluation point. The difficulty in applying this method lies in the challenge of determining the incremental income of the regional brand and the brand discount rate, which significantly limits its application.

3.2 Multidimensional Brand Value Evaluation Models

This type of model improves upon the traditional income approach by using brand strength indicators to estimate the risks a brand may face or the duration of its sustainable earnings, and by measuring the value of brand strength from different dimensions. For example, Interbrand measures brand strength across seven dimensions: market leadership, stability, market characteristics, internationalization capability, trend (relevance to consumers), brand support, and legal protection. Tan Xiaoping et al. constructed a brand strength index across five dimensions: geographical factors, product factors, market competitiveness factors, brand factors, and legal factors. Hu Xiaoyun et al. adopted dimensions

including brand driving force, brand resource capacity, brand management capability, brand communication power, and brand development potential [13].

3.3 Construction of the Regional Agricultural Brand Value Evaluation Model in This Paper

This paper intends to evaluate the effectiveness of regional brand development from multiple dimensions, taking into account the roles of stakeholders—including production enterprises, farmers, industry associations, and local governments—in the cultivation, marketing, and management of regional brand value. Drawing on the Interbrand model and the CARD agricultural product brand value evaluation model, this paper constructs an evaluation model for regional agricultural brand value as follows:

$$\text{Regional Public Brand Value} = \text{Brand Earnings} \times \text{Regional Brand Strength Multiplier} \times \text{Regional Brand Loyalty Factor} \quad (1)$$

3.3.1 Determination of brand earnings

Brand earnings refer to the excess income generated by a regional brand compared to non-regional brands, derived from the market premium of regional brand products over non-regional brand products. Brand earnings depend on four factors: annual sales volume before brand development, annual sales volume after brand development, the average retail price of branded products, and the average retail price of non-branded products. The calculation formula is:

$$\text{Brand Earnings} = (\text{Average Price of Branded Products} \times \text{Annual Sales Volume After Brand Development}) - (\text{Average Price of Non-Branded Products} \times \text{Annual Sales Volume Before Brand Development}) \quad (2)$$

Data on annual sales volume before and after brand development are obtained through surveys. The average price of branded products is represented by the average price of a specific type of agricultural product in the evaluated region. The average price of non-branded products is represented by the average price of that same type of agricultural product in a non-evaluated region.

3.3.2 Determination of the brand strength multiplier

The brand strength multiplier reflects the brand's future sustainable earnings capacity, risk resistance, and competitiveness. Drawing on Interbrand's approach to brand strength, a brand strength indicator system is constructed consisting of five dimensions: brand driving force, brand resource capacity, brand management capability, brand communication power, and brand development potential. Experts assign scores to each indicator constituting brand strength, and the weighted sum of these scores yields the brand strength index. The brand strength index is positively correlated with the brand value multiplier, and its dynamics can be modeled using an S-curve. During the introduction stage of the brand lifecycle, although enterprises invest substantial resources in brand development, the brand premium effect (i.e., the brand multiplier) remains at a relatively low level. When brand strength reaches a critical threshold, it enters a rapid growth stage, during which the brand's premium capacity significantly improves, manifested by expanded product pricing power and enhanced customer loyalty. However, when the brand reaches the maturity stage, due to factors such as market saturation, the growth rate of the brand multiplier tends to flatten. Only through continuous product innovation can the brand value curve achieve secondary growth. The formula for converting the brand strength index into the brand multiplier is as follows:

Assuming x represents the brand strength score and y represents the brand strength multiplier, the formula for the relationship between brand strength and the brand strength multiplier is (where the value of y ranges from 0 to 20):

$$\begin{cases} 250y = x^2, x \in [0, 50] \\ (y-10)^2 = 2x-100, x \in (50,100) \end{cases} \quad (3)$$

3.3.3 Determination of the brand loyalty factor

The brand loyalty factor primarily reflects the stability of brand development and indicates the level of consumer recognition and loyalty toward the brand. The calculation of this factor focuses on whether stable prices and sales can be maintained over an extended period. The brand loyalty factor is equal to the difference between the average selling price over the past five years and the standard deviation of the selling price, divided by the average selling price over the past five years. The calculation formula is:

$$\text{Brand Loyalty Factor} = (\text{Average Selling Price Over the Past Five Years} - \text{Standard Deviation of Selling Price}) \div \text{Average Selling Price Over the Past Five Years} \quad (4)$$

4 EMPIRICAL ANALYSIS: THE CASE OF MAOMING LITCHI

As a major litchi-producing region in Guangdong Province, Maoming City has consistently placed great emphasis on the development of its regional litchi brand. As early as 2004, Maoming's "Baitangying Litchi" was successfully recognized as a China National Geographical Indication Protected Product. In 2013, the Gaozhou Litchi Association registered the "Gaozhou Litchi" geographical indication certification trademark. In 2022, the "Maoming Litchi" geographical indication certification trademark was applied for and registered. In 2023, Maoming City issued the Three-Year Action Plan for Enhancing "Specialty Agricultural Product Customization" (2024–2026), which identified expanding the influence of regional public brands such as "Maoming Litchi" as one of its overall objectives, actively promoting the brand and strengthening the brand system. In 2024, the Maoming Municipal People's Government issued the *Administrative Measures for the Use of the "Maoming Litchi and Design" Geographical Indication Certification Trademark* to strengthen trademark protection and further advance the development of the Maoming litchi brand. Additionally, Maoming City has hosted the "China Litchi and Longan Industry Conference," the

"Maoming Litchi Carnival," and the "100,000 E-Commerce Sellers Litchi Sales Competition" for several consecutive years—a series of promotional activities that have effectively expanded the brand influence of "Maoming Litchi." As a key supply region for litchis in Guangdong Province and even nationwide, evaluating the Maoming litchi regional brand can help assess the impact and driving effect of the Maoming litchi brand on regional economic and social development in recent years, providing policy recommendations for the development of the Maoming litchi brand. Currently, no professional institution or expert has yet evaluated its regional brand value. This paper aims to add a new case study to research on the evaluation of regional agricultural brand value.

4.1 Overview of the Development of the Maoming Litchi Regional Agricultural Brand

4.1.1 Overview of the litchi industry

Maoming boasts a unique geographical and climatic environment. Situated in the transitional zone between the tropics and subtropics, it features a subtropical monsoon humid climate, with hot summers and warm winters, a long rainy season, and abundant precipitation. The annual average temperature ranges from 22.3°C to 23°C, annual rainfall is between 1,500 and 1,800 millimeters, and the annual sunshine rate exceeds 35.6%. The large areas of mountainous and hilly terrain consist of slightly acidic red soil with a relatively deep soil layer. Maoming has a history of litchi cultivation spanning over 2,300 years. Currently, the city has a total litchi planting area of approximately 1.42 million mu, with an annual output exceeding 600,000 tons. In its early days, Maoming litchi mainly consisted of the Heiye and Baila varieties. Through subsequent improvements, varieties such as Sanyuehong, Baitangying, Feizixiao, Guiwei, and Nuomici were introduced, which not only improved variety quality but also staggered market availability, thereby optimizing the industrial structure. In 2023, the total output of Maoming litchi reached 620,900 tons, an increase of 12.77% compared to 2022. In that year, Guangdong Province's output was 1.63 million tons, with Maoming's output accounting for approximately one-third of the province's total (as shown in Figure 1).

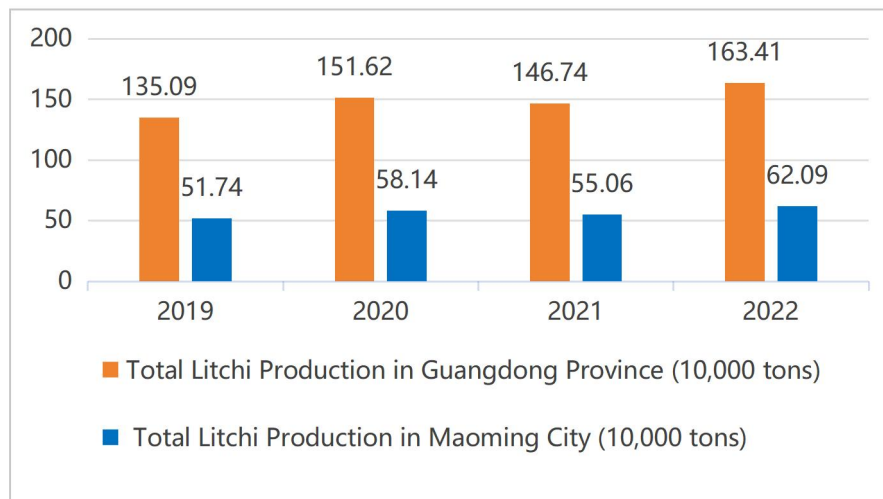


Figure 1 Litchi Output and Sales Revenue, 2019-2022

Currently, Maoming possesses three nationally recognized geographical indication products (Gaozhou Litchi, Maoming Litchi, and Baitangying Litchi) and four regional public brands of Guangdong Provincial Famous, Special, Excellent, and New Agricultural Products (Gaozhou Litchi, Dianbai Litchi, Maoming Baitangying Litchi, and Shatian Jizui Litchi). To ensure litchi quality, the Maoming Agriculture and Rural Affairs Bureau has established clear standards for products using the Maoming Litchi geographical indication, ensuring that Maoming litchi commodities meet the requirements from production to market launch. For fresh litchi, the production standards of the "Technical Code for Litchi Production" (DB 4409/T 20-2021) must be strictly implemented. Litchi fruit grades must comply with the "Grades and Specifications of Litchi" (NY/T 1648-2015), while litchi sold online must meet the requirements of the "Grades and Specifications of Litchi Sold Online" (DB4409/T 09-2020). Separate sales standards are established for individual litchi varieties. For dried litchi, production enterprises using the "Maoming Litchi" certification trademark must obtain a food production permit, and their dried litchi products must also comply with the standards of the "Hygienic Standard for Dried Fruits" (GB 16325-2005) and the "Green Food—Dried Fruits" (NY/T 1041-2018). According to the grade standards in "Grades and Specifications of Litchi," litchi fruit are classified into three specifications: small, medium, and large. Large fruits weigh approximately 25 grams, medium fruits weigh between 15 and 25 grams, and small fruits weigh less than 15 grams (as shown in Table 1).

Table 1 Litchi Specifications

Specification	Large (L)	Medium (M)	Small (S)
Single Fruit Weight (g)	>25	15–25	<15
Maximum Weight Difference Within the Same Package (g)	≤5	≤3	≤1.5

According to the grade standards in the Grades and Specifications of Litchi, litchi fruit are divided into three grades, among which the "Extra" grade has the strictest requirements and represents the highest quality (as shown in Table 2).

Table 2 Litchi Grades

Grade	Requirements	Remarks
Extra	Possesses the characteristic morphological features and inherent color of the litchi variety; no discoloration, no brown spots; fruit size uniform; no cracked fruits; no defective fruits such as those with mechanical damage, pest or disease symptoms, or foreign contamination; no fruits of other varieties	Tolerance by weight: 5% of products may not meet the requirements of this grade but shall meet the requirements of Grade 1
Grade 1	Possesses the characteristic morphological features and inherent color of the litchi variety; essentially no discoloration, essentially no brown spots; fruit size essentially uniform; essentially no cracked fruits; essentially no defective fruits such as those with mechanical damage, pest or disease symptoms, or foreign contamination; essentially no fruits of other varieties	Tolerance by weight: 8% of products may not meet the requirements of this grade but shall meet the requirements of Grade 2
Grade 2	Essentially possesses the characteristic morphological features and inherent color of the litchi variety; slight discoloration, slight brown spots; fruit size essentially uniform; slight cracked fruits; slight defective fruits such as those with mechanical damage, pest or disease symptoms, or foreign contamination; slight presence of other varieties	Tolerance by weight: 10% of products may not meet the requirements of this grade but shall meet the basic requirements

4.2 Evaluation of Maoming Litchi Brand Value

4.2.1 Basic evaluation matters

The purpose of evaluating the regional brand value of Maoming Litchi is to provide a value reference for relevant stakeholders. It is assumed that all litchi produced in the region in a given year can be sold out, with output equaling sales volume; it is also assumed that the litchi production area in the evaluated region remains unchanged; the evaluation date is December 31, 2023.

4.2.2 Estimation of evaluation parameters

1) Brand Earnings

This paper uses the incremental income method to calculate brand earnings, taking the earnings of regional brand litchi minus the earnings of non-regional brand litchi as brand earnings.

$$\text{Brand Earnings} = (\text{Average Price of Branded Products} \times \text{Annual Sales Volume After Brand Development}) - (\text{Average Price of Non-Branded Products} \times \text{Annual Sales Volume Before Brand Development}) \quad (5)$$

Annual sales volume: Based on the assumption that the litchi production area in Maoming remains unchanged and that output equals sales volume, the annual sales volume before brand development equals that after brand development. The average annual sales volume over the past five years is used, approximately 541,700 tons.

Average price of regional brand products: refers to the average selling price of Maoming litchi. The wholesale price at origin for Maoming litchi is used. Through data collection and inquiry, the comprehensive wholesale price of Maoming litchi from 2019 to 2024 is approximately 10.6050 RMB/kg.

Average price of non-regional brand products: the average wholesale price of litchi in Zhanjiang region is used as the price for non-regional brand litchi, approximately 10.2548 RMB/kg, see Figure 2. Therefore:

$$\text{Brand Earnings} = 541,700 \times (10.6050 - 10.2548) \times 10^7$$

$$= 189,703,340 \text{ RMB}$$

$$\approx 189.70 \text{ million RMB}$$

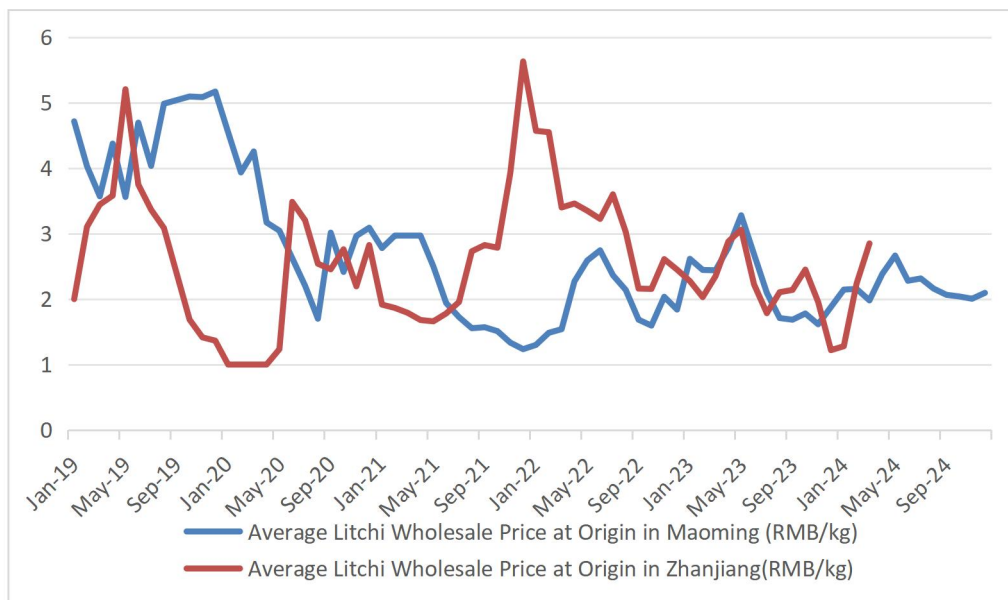


Figure 2 Litchi Average Wholesale Price

2) Calculation of the Brand Strength Multiplier

The brand strength indicators for Maoming Litchi consist of five dimensions: brand driving force, brand resource capacity, brand management capability, brand communication power, and brand development potential. The analytic hierarchy process (AHP) is used to determine the weight of each dimension.

Step 1: Seven experts were invited to form a team to compare the five dimensions of brand strength against one another and test for consistency. The comparison table for the five dimensions is shown below (Table 3).

Table 3 Comparison Table of the Five Dimensions of Brand Strength

Brand Dimension	Brand Driving Force	Brand Resource Capacity	Brand Management Capability	Brand Communication Power	Brand Development Potential
Brand Driving Force	1	1/2	1	1/3	1
Brand Resource Capacity	2	1	2	1/2	2
Brand Management Capability	1	1/2	1	1/2	2
Brand Communication Power	3	2	2	1	2
Brand Development Potential	1	1/2	1/2	1/2	1

Based on the comparison table of the five dimensions of brand strength, a judgment matrix for all factors is constructed.

Step 2: Calculate the Weights

Based on the constructed comparison matrix, the weight distribution of different influencing factors is calculated by multiplying the values in each row, extracting the root, and performing normalization.

First, multiply the scores in each row of the matrix:

$$C_i = \prod_j^5 b_{ij}, i=1,2,3,\dots,5 \tag{6}$$

Second, take the nth root of each brand influencing factor. Since the number of selected factors is 5, n = 5:

$$S_i = \sqrt[5]{C_i}, i=1,2,3,\dots,5 \tag{7}$$

Finally, normalize the vector C_i to obtain the eigenvector Q:

$$Q = (0.1285, 0.2427, 0.1601, 0.3473, 0.1213)$$

Step 3: Consistency Test

To further verify the consistency and appropriateness of the ranking of importance of factors related to brand value in the evaluation scheme, a consistency test procedure must be implemented, see Table 4.

Table 4 RI Values Corresponding to Matrix Orders

Matrix Order	1	2	3	4	5	6	7	8	9	10
RI	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.49

First, a consistency test is performed on the eigenvector Q, and the maximum eigenvalue of the comparison matrix is calculated as $\lambda_{max}=4.22$. Second, according to Formula 4, $CI=0.0284$. Third, the corresponding RI value for a matrix order of 5 (five dimensions) is found in the table of matrix order correspondences, yielding $RI=1.12$.

$$CR = \frac{CI}{RI}, \text{ where } CI = \frac{\lambda_{max} - n}{n - 1} \quad (8)$$

According to Formula 8, $CR=0.0254$, $CR < 0.1$ the consistency test is passed, indicating that the weights of the various brand strength indicators are reasonably valid.

Subsequently, an expert panel conducted a detailed analysis of the five dimensions of brand strength for "Maoming Litchi" as follows:

Brand Driving Force. The Maoming litchi industry radiates to western Guangdong and parts of Guangxi's production areas, forming a cross-regional collaboration alliance. In 2022, it drove a new planting area increase of 50,000 mu in surrounding regions, with the region's output value share rising from 15% to 22%. In terms of economic status, the litchi industry accounts for 35% of Maoming's total agricultural output value, directly employs over 800,000 people, and indirectly drives related industries such as packaging and logistics, generating an output value exceeding 5 billion RMB.

Brand Resource Capacity. In terms of environmental resources, Maoming is located between 21°25'N and 22°43'N, featuring a golden climate zone with relatively high annual average temperatures. In the northern part, mountains such as Datianding, Mianbeiding, and Ehuangzhang lift warm air masses from the south in spring and summer, resulting in abundant rainfall in the southern mountainous areas, with annual precipitation ranging from 1,162 to 2,582 millimeters. Locally grown Heiye variety litchi has a soluble solids content of 16.5% to 20%, while Guiwei litchi has a soluble solids content of 18% to 21%. The history of litchi cultivation in Maoming dates back to the Qin and Han dynasties. According to the Maoming City Annals, local litchi were already being offered as tribute to the imperial court since the Tang Dynasty. There are currently 19,675 ancient litchi trees over 100 years old, with the oldest being over 1,900 years old. This historical heritage not only endows the brand with a "living fossil" cultural label but also forms a unique variety protection system through the ancient tree resources. In terms of cultural resources, Maoming leverages litchi-themed festival events (such as the "China Litchi Industry Conference") to attract over 500,000 visitors annually. Combined with the "Great Tang Litchi Hometown" cultural tourism IP, it has formed a "litchi + tourism + culture" integrated industrial chain. In 2022, Maoming's total litchi sales volume reached 550,600 tons, with fresh litchi sales revenue reaching 8.07 billion RMB^{1,2}.

Brand Management Capability. Since 2018, Maoming City has implemented the Maoming Litchi Whole Industry Chain Standards, covering 22 technical specifications including planting, harvesting, sorting, and cold chain logistics, with standardization coverage increasing from 65% to 92% by 2023. In terms of the testing system, the city has established 12 regional agricultural product quality inspection centers, conducting over 100,000 sample tests annually, with the pesticide residue pass rate remaining above 90% for five consecutive years. Regarding the certification system, Maoming Litchi has obtained 13 domestic and international certifications, including National Geographical Indication Product, Green Food, and GLOBALG.A.P., driving an average annual export growth of 21%. A total of 93 enterprises have been registered and authorized to use the "Maoming Litchi and Design" Geographical Indication Certification Trademark, of which 68 are registered under fresh litchi (Class 31). [Source: List of Enterprises Registered and Authorized to Use the "Maoming Litchi and Design" Geographical Indication Certification Trademark, Maoming E-commerce Platform WeChat Official Account] At the organizational management execution level, relying on the "government + association + enterprise + farmer" four-tier linkage mechanism, technical training was conducted in 2022, covering over 10,000 fruit farmers, effectively increasing average yield per mu and improving management efficiency.

Brand Communication Power. According to the 2023 China Regional Public Brand Influence Index of Agricultural Products report, the exposure of the Maoming Litchi brand reached 320 million views, ranking first among fruit categories. The Baidu Search Index for "Maoming Litchi" peaked at over 120,000 during the marketing season, an increase of 180% compared to 2020. In terms of awareness, third-party research shows that consumer recognition of Maoming's core litchi-producing areas (such as Gaozhou and Dianbai) increased from 48% in 2019 to 76% in 2023, while the spontaneous mention rate of variety names such as "Feizixiao" and "Baitangying" exceeded 60%. Favorability is driven by a combination of quality and marketing. In 2023, e-commerce platform user evaluation data showed that the repurchase rate for Maoming Litchi reached 45%, with a negative review rate below 1.2%. Additionally, through innovative marketing models such as "litchi customization" (e.g., the "Adopt an Ancient Litchi Tree" campaign), a total of 38,000 consumers were engaged, and the emotional connection index rose to 8.7 points (out of a maximum of 10).

Brand Development Potential. In 2023, Maoming City issued the Litchi Industry Protection Regulations, establishing a special rights protection fund of 20 million RMB, with the case resolution rate for infringements increasing by 40% year-on-year. In terms of market coverage, the cold chain logistics network now covers 280 cities nationwide and has expanded to RCEP member countries, with export volume share increasing from 5% to 12%. Regarding production trends, smart orchards account for 18% of the total, AI pest and disease warning systems have reduced losses by approximately 15%, and annual investment in brand marketing has grown by an average of 25%, injecting momentum into long-term sustainable development.

¹Data source: https://news.ycwb.com/2023-04/14/content_51882825.htm, accessed April 23, 2025

²Data source: <https://baijiahao.baidu.com/s?id=1825900998805521405&wfr=spider&for=pc>, accessed April 23, 2025

Based on the above analysis, the expert panel discussed and scored the performance of the Maoming Litchi brand value, reaching a consensus on the scores for each dimension of brand value, see Table 5. The final brand strength index score was 75.76, which was converted into a brand strength multiplier of 17.1777 according to Formula 3.

Table 5 Maoming Litchi Brand Strength Indicator System

Indicator	Indicator Weight	Evaluation Content	Score
Brand Driving Force	0.1285	The driving effect of the Maoming Litchi geographical brand on litchi development	70
Brand Resource Capacity	0.2427	Historical and cultural resources of the Maoming Litchi brand	85
Brand Management Capability	0.1601	Production, sales system, and management of Maoming Litchi	80
Brand Communication Power	0.3473	Public awareness of the Maoming Litchi brand	75
Brand Development Potential	0.1213	Market development trends and sustainable development potential of the Maoming Litchi brand	60

Estimation of the Brand Loyalty Factor

The brand loyalty factor reflects the stability of the selling price, and its calculation formula is:

$$\text{Brand Loyalty Factor} = \frac{(\text{Average Selling Price Over the Past 5 Years} - \text{Standard Deviation of Selling Price})}{\text{Average Selling Price Over the Past 5 Years}} \quad (9)$$

Based on the selling price data of Maoming Litchi from 2019 to 2023 (Table 6), the relevant data were substituted into Formula 9, yielding the following results:

The average selling price over the past five years is 13.22 RMB/kg; the standard deviation of the selling price is 0.63. Therefore, the brand loyalty factor is calculated to be 0.9046, or 90.46%.

Table 6 Maoming Litchi Production and Sales Over the Past 5 Years

Year	Total Output (10,000 tons)	Sales Revenue (100 million RMB)	Average Price (RMB/kg)
2019	43.82	51.26	11.7
2020	55.06	69.20	13.38
2021	59.10	71.20	12.24
2022	55.06	80.70	14.66
2023	62.09	88.50	14.26

3) Conclusion of Regional Brand Value Evaluation

Substituting the parameters of brand earnings, brand strength multiplier, and brand loyalty into Formula 1, the regional brand value of Maoming Litchi is obtained. Based on the data calculated above:

$$\begin{aligned} \text{Maoming Litchi Brand Value} &= \text{Brand Earnings} \times \text{Brand Strength Multiplier} \times \text{Brand Loyalty Factor} \\ &= 189.70 \text{ million} \times 17.1777 \times 90.46\% \\ &= 2,947.73 \text{ million RMB} \\ &\approx 2.948 \text{ billion RMB} \end{aligned}$$

4) Rationality Analysis of the Evaluation Results

According to the evaluation results of China's fruit regional public brand value, the brand value of Gaozhou Litchi in 2022 was 2.958 billion RMB. Gaozhou is a county-level city under the administration of Maoming, while the geographical scope of the regional brand evaluation in this study is Maoming City, which is larger than that of Gaozhou. However, Gaozhou Litchi is highly renowned and represents a major production area within Maoming. In terms of industry driving capacity, the influence of Maoming Litchi is expected to be greater than that of Gaozhou Litchi. However, a larger litchi planting area and higher output may imply that product quality and reputation could be somewhat lower than those of the core Gaozhou Litchi production area. The evaluation results show that the brand value of Maoming Litchi is 2.948 billion RMB, which is close to the brand value of Gaozhou Litchi at 2.958 billion RMB. This evaluation result is considered reasonable and acceptable.

5 CONCLUSIONS AND PROSPECTS

5.1 Research Conclusions

This paper analyzes the components and influencing factors of regional agricultural brand value, draws on domestic and international brand value evaluation methods, and constructs a new evaluation model for regional agricultural brand value. It posits that the value of a regional agricultural brand is the product of brand earnings, brand strength multiplier, and brand loyalty. The paper takes the Maoming Litchi regional brand as a case study for evaluation. The brand strength score of the Maoming Litchi regional brand is 74.04, the brand strength multiplier is 16.9340, and the brand loyalty factor is 90.46%, resulting in a final brand value of 2.906 billion RMB.

The process and results of the regional brand value evaluation reflect the strengths and weaknesses in the development

of the Maoming Litchi regional brand. During the evaluation of Maoming Litchi brand value, brand strength was assessed across multiple dimensions, including brand driving force, brand resource capacity, brand management capability, brand communication power, and brand development potential, revealing the overall competitiveness of the Maoming Litchi brand. In terms of brand driving force, the degree of association and driving capacity between the brand and the region is insufficient. Regarding brand resource capacity, the historical and environmental resources of the Maoming Litchi brand are underutilized. In terms of brand management capability, the formulation and implementation of production standards are not yet fully developed, the certification system lacks sufficient influence, and organizational management execution capacity is inadequate. Regarding brand communication power, brand awareness is a notable weakness. In terms of brand development potential, brand protection efforts need to be strengthened.

Further efforts should focus on exploring brand resources, and organizing the cultivation history and cultural stories of Maoming Litchi, combining them with modern technological methods to develop relevant cultural and creative products, telling compelling brand stories, and transforming historical resources into brand cultural competitiveness.

Brand development and market promotion should be strengthened by adopting unified brand visual identity and messaging to convey brand values and enhance consumers' sense of identification and goodwill toward the brand.

Brand management should be reinforced by establishing industry standards, standardizing the certification system and processes, strengthening digitalization efforts, and improving product quality tracking and control.

A sound brand protection mechanism should be established by enhancing intellectual property protection awareness, intensifying efforts to combat counterfeiting, infringement, and other violations, establishing a brand rights protection support mechanism, and building a comprehensive brand protection system.

5.2 Research Prospects

Agricultural products are a source of livelihood for farmers, and agriculture is the lifeline of rural economies. The development of regional agricultural brands holds great significance for agriculture, rural areas, and farmers. However, agricultural production is heavily constrained by land resources and climate, and the scale, industrial development, agglomeration conditions, and technological applications of agricultural products vary greatly across regions. Agriculture typically involves low technological content, relatively low productivity, and low industry profitability. In most cases, agricultural production areas cannot sustain local livelihoods, let alone achieve production expansion. As a result, agriculture is unable to accomplish capital self-accumulation, and rural areas often remain impoverished. The development of regional agricultural brands often faces difficulties due to a lack of human capital, limited investment funds, high logistics costs, and weak brand awareness and intellectual property protection awareness. Although the Maoming Litchi regional brand in this case has developed over many years and achieved considerable local recognition, it still faces the challenges mentioned above, and its overall brand value remains relatively low.

In this study, seven experts were invited to conduct the evaluation. The main reason for not increasing the number of experts is that most local practitioners are farmers with relatively low levels of education. They typically rely on experience for production, lacking professional technical knowledge and brand awareness. Future research in this area is expected to involve more in-depth fieldwork and interviews to obtain more detailed data for further in-depth investigation.

COMPETING INTERESTS

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