

# From Local Mountain Village to the International Trade: the Technological Empowerment of Le'an Bamboo Shoots

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**Abstract:** Le'an County is located in the central part of Jiangxi Province and the southwest part of Fuzhou City, leverages its unique subtropical mountain habitat to empower the entire bamboo shoot industry chain through technological innovation. By integrating field surveys, laboratory tests, and big data analysis, the ecological advantages of Le'an bamboo shoots have been systematically revealed: The quality of soil and water is superior to European Union (EU) standards, and nutritional indicators such as protein content are excellent. Scientific research has laid a solid foundation for brand building, and in 2025, the brand value of "Le'an Bamboo Shoots" reached 1.792 billion CNY. The product was successively showcased at the China International Service Trade Fair (CIFTIS) and the First Food and Agriculture Organization of the United Nations (FAO) global exhibition "From Seeds to Foods", gaining international recognition and securing a major export contract with European buyers. This achievement represents a significant leap in value from a remote mountain habitat to the global stage, providing a replicable model for the realization of ecological product value and rural industrial revitalization.

**Keywords:** Le'an bamboo shoots; technological empowerment; brand value; sustainability; geographic indications

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## 1 Introduction

A bamboo shoot encapsulates the ecological significance of the subtropical mountain region; a research project decodes the sustainable development pathway for a specialty industry; a transformative journey brings local forest products to the international stage. In 2024, the Geographical Indications Environment & Sustainability (GIES) case on Le'an bamboo

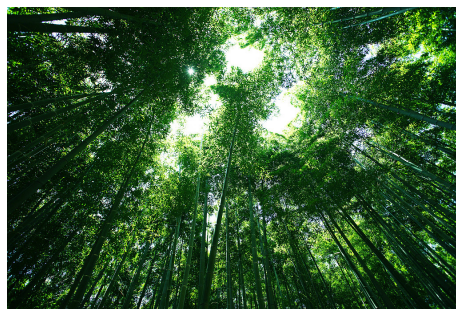
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shoots in subtropical mountains in Le'an County, Jiangxi Province of China (abbreviated as "Le'an Bamboo Shoots Subtropical Mountains Case")<sup>[1]</sup>, led by the Le'an County Government and spearheaded by Dr. YAN Lingyuan from the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (IGSNRR, CAS), was reviewed and approved by the Innovation China and Geographical Indications Environment & Sustainability Professional Technology Service Team. It was designated as the 19th GIES case. Through the practical exploration spanning "from scientific certification to the international arena", Le'an County in Jiangxi Province has used technology as a bridge to connect the entire chain of ecological protection, quality improvement, industrial upgrading, and global circulation, writing a vivid exemplar of technology-empowered, high-quality development in rural industries (Figure 1).



**Figure 1** Bamboo forests in Le'an County, Fuzhou City, Jiangxi Province

## 2 Scientific Foundation: Safeguarding a Unique Mountain Habitat with Data

Le'an County is located in the central hinterland of Jiangxi Province and has a subtropical humid monsoon climate. With a forest coverage rate of more than 70% and 26,666.67 ha of continuous bamboo forests, it provides a natural nurturing ground for bamboo shoot growth. The case study published in the *Journal of Global Change Data & Discovery* in 2024 systematically revealed the ecological advantages of Le'an bamboo shoots by means of field investigations, laboratory analyses, and big data integration. The soil quality exceeds EU standards for agricultural land, and the water quality is superior to China's standards for drinking water quality and the European Union standard. Such an excellent ecological environment collectively nurtures high-quality bamboo shoots featured by thick flesh, tender texture, and rich nutrition. On this basis, science and technology have been further applied to the production process. An Internet of Things (IoT) environmental monitoring system has been introduced, with sensors deployed in core bamboo shoot production areas to collect real-time data on temperature, humidity, light, and other indicators, so as to realize the traceability of the ecological environment and growth process of Le'an bamboo shoots, thus implementing the concept of GIES<sup>[2]</sup>.

**Table 1** Test result of nutritional values of Le'an bamboo shoots<sup>[3]</sup>

Testing company	Sampling time	Testing time	Sample name	Sample type	Unit	Protein	Fat (limit of quantitation)
Centre Testing International (Wuhan) Co., Ltd	2022.3	2022.3	Grilled bamboo shoots tips	Processed product	g/100g	2.75	0.3
			Boiled bamboo shoots	Processed product	g/100g	2.55	0.2
Weifang Harrens-HC Inspection & Technology Co., Ltd	2022.6	2022.6	Small wild bamboo shoots	Processed product	g/100g	2.7	0 (0.5)
			Grilled bamboo shoots tips	Processed product	g/100g	2.6	0 (0.5)
Institute for Quality & Safety and Standards of Agricultural Products Research, Jiangxi Academy of Agricultural Sciences	2024.1	2024.2	Bamboo shoots	Fresh bamboo shoots	%	2.9	–
Anhui Consumer Testing Technology Co., Ltd	2024.7	2024.8	Winter bamboo shoots	Processed product	g/100g	2.38	0.4

### 3 Value Upgrading: from Mountain Markets to the CIFTIS

Technology empowerment has directly driven brand appreciation along the product value chain. In 2025, the brand value of Le'an bamboo shoots was evaluated as 1.792 billion CNY by the China Council for Brand Development<sup>[4]</sup>, representing an increase of 421 million CNY from 1.371 billion CNY in 2023 and achieving leapfrog growth. In September of the same year, Le'an bamboo shoots GIES case was presented at the 2025 CIFTIS, participating in the joint exhibition of One Country One Priority Product and GIES jointly organized by the FAO and the IGSNRR, CAS (Figure 2). At the exhibition, Dr. YAN Lingyuan, the chief scientist of the case, delivered a special presentation to the One Country One Priority Product Secretariat, the FAO Aisa and Pacific Office, and representatives from various demonstration countries. She interpreted the unique flavor, quality, and superior ecological value of Le'an bamboo shoots with scientific rigor, enabling the world to understand the leap of Le'an bamboo shoots from mountain ecological advantages to an international quality benchmark.



**Figure 2** China International Fair for Trade in Services (2025, Beijing, China)

### 4 Brand Leadership: Forging a New Path of Global Circulation with Scientific Certification

In October 2025, as an outstanding representative of GIES, Le'an bamboo shoots was invited to participate in the First FAO global exhibition “From Seeds to Foods” held in Rome, Italy. By translating academic achievements—including habitat research and nutritional component analysis of Le'an bamboo shoots—into brand communication materials, it highlighted the distinctive features of “primitive subtropical mountain ecology”, “scientific traceability” and “excellent nutritional quality”, winning wide recognition and praise from international participants. At the exhibition, the Fuzhou Municipal Delegation fully affirmed the achievements of the case. At the Special Forum on Technical Application of GIES hosted by the IGSNRR, CAS, Mr. AI Zhifeng, Secretary of the Le'an County and the government representative of the Le'an bamboo shoots subtropical mountain case, shared the “Le'an Experience” of how the government promotes the sustainable development of characteristic agriculture, increases farmers' income and advances rural revitalization through the GIES model (Figure 3).



**Figure 3** The first FAO global exhibition “From Seeds to Foods” Special Forum on Technical Application of GIES (2025, Rome, Italy)

Scientific endorsement and quality upgrading have opened the door to the global market

for Le'an bamboo shoots. Le'an bamboo shoots, a national geographical indication product and one of the first batch of China-EU mutual recognition geographical indication products, have secured a 6.22 million USD export order with Italian buyers via Jiangxi Guangya Food Co., Ltd, a leading local enterprise (Figure 4). This demonstrates that, backed by robust scientific quality certification, Le'an bamboo shoots have paved the way for bilateral trade in geographical indication products between China and Europe.



**Figure 4** Signing ceremony between Jiangxi Guangya Food Co., Ltd and Italian buyers (2025, Rome)

## 5 Conclusion

Technology protects the ecology, ecology nurtures quality, and quality builds the brand. Relying on academic research to consolidate its ecological foundation, digital technology to empower industrial development, and international certification to expand market access, Le'an bamboo shoots has blazed a distinctive industrial pathway featuring ecology priority, technology leadership, green development, and global sharing.

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