Traditional and Modern Fusion: The Application and Challenges of Leizhou Cattail Weaving in Modern Cultural Creative Designs

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Abstract

Leizhou cattail weaving, a significant intangible cultural heritage of Guangdong, embodies rich historical and cultural value. However, modernization has led to challenges such as a decline in inheritors, limited design innovation, and restricted market reach. The emergence of cultural and creative industries presents new opportunities to revitalize this traditional craft and support its sustainable development. This study, adopting a cultural and creative industries perspective, integrates literature research and fieldwork to examine the craftsmanship, cultural significance, and contemporary applications of Leizhou cattail weaving. Through semistructured interviews, it explores the craft's development within modern cultural and creative design. Findings indicate that while Leizhou cattail weaving excels in material selection and technique, it falls short in aesthetics and innovation, limiting its market appeal. Drawing on domestic and international industry practices, this study proposes sustainable development strategies to support its modernization and offer insights for the broader revitalization of traditional handicrafts.

Keywords: Intangible Cultural Heritage, Leizhou Cattail Weaving, Cultural and Creative Industries, Product Design, Cultural Inheritance

1. Introduction

Rush weaving, a traditional craft from Leizhou City in Guangdong Province, carries rich historical and cultural significance and is an important part of the region's intangible cultural heritage. However, with the acceleration of modernization, traditional techniques face challenges such as the reduction of inheritors and market difficulties. How to achieve sustainable inheritance and innovative development of this craft has become an urgent issue. Cultural and Creative Industries (CCI) theory offers a new perspective for the revitalization of traditional crafts, emphasizing the economic value of culture, cross-industry integration, and social impact. Through design innovation, brand building, and market promotion, traditional culture can be integrated with modern consumer needs, driving the modernization of traditional crafts. Leizhou cattail weaving, with its natural environmental advantages, aligns well with modern design concepts. Despite its historical prominence, it has

lagged in the modern market due to issues such as a gap in inheritors, lack of innovation, and insufficient market promotion. How to leverage CCI theory to facilitate its transformation becomes the core focus of this research. This study, through literature review, field observation, and semi-structured interviews, will analyze the craftsmanship, cultural value, and modern design applications of Leizhou cattail weaving. It will explore the challenges it faces and propose solutions, aiming to provide new insights for the sustainable development of Leizhou cattail weaving and offer a reference for the modernization of other traditional crafts.

1.1 Research Objective

This research aims to explores the history, style, and techniques of traditional cattail weaving in Leizhou City, Guangdong Province, and analyzes the development strategies for cultural and creative products based on cattail weaving.

2. Literature Review

1. Research on woven cattail products

1.1 Domestic and international research on woven bushy grass products: Domestic research on reed weaving focuses on traditional techniques, inheritance, regional differences and cultural integration. Zhang Xianzhen's Craft of Straw Weaving describes in detail the skills of grass weaving in the north and south, especially the techniques and designs of reed weaving. Xing Guifen's Craftsmanship of Farming Leisure briefly describes grass weaving techniques and their applications in the suburbs of Beijing. Gao Chengmiao's studies (2016, 2017) revealed the history, techniques and cultural values of reed weaving on the Leizhou Peninsula (Chengmiao, 2017). Wang Xia (2013) introduced the method and process of reed weaving (Xia, 2013). In addition, the chapter 'Weaving and tying' in Chinese Handicrafts explores the application of reed weaving, whose flexibility and durability have led to its widespread use in daily necessities and handicrafts (Lianhai, 2022).

Foreign studies have focused on the ecological, cultural and historical values of cattail weaving. Diane Dittemore's Weaving from the Centre: Native Basketry in the Southwest explores the cattail basketry of the native peoples of the Southwest and Northern Mexico (Dittemore, 2024). Insights into the Natural and Cultural History of New Zealand Balsam analyses the ecological and cultural value of balsam in New Zealand (Li et al., 2024). Windows on the African Past, on the other hand, examines the archaeological applications of chamise at the Sibudu site in South Africa (Fahmy et al., 2011). These studies emphasise the importance of cattail weaving in traditional crafts and modern applications through an interdisciplinary perspective.

1.2 Domestic and overseas creative straw products: Luo Yimei, Zhang Guangyi, and Liu Yongfeng have modernized cattail weaving through innovation and inheritance. Luo Yimei blends traditional craftsmanship with modern aesthetics to create practical and artistic cattail crafts, raising public awareness. Zhang Guangyi promotes bushy straw weaving through exhibitions, training, and school education, emphasizing its cultural roots and techniques. Liu

Yongfeng enhances marketability via a crafts co-op and training programs, driving local economic and cultural revitalization. Globally, cattail weaving merges tradition with modern design. Japan's Okitsu baskets balance practicality and artistry. The U.S. brand Cherie's Place innovates with a crownless straw hat. Mexico's Woloch fuses craftsmanship with contemporary aesthetics in its Jipijapa Palm Leaf Hand Fan. Thai brands like Wicker Thailand and VT Thai integrate eco-friendly design with fashion, boosting global recognition of woven bushel bags.

2. Cultural Creativity Related Research

2.1 Theory of Cultural and Creative Industries: Cultural Creative Industry (CCI) is an industry that expresses cultural resources through creative transformation and innovation to form economic value and promote social progress, covering the fields of art, design and media (Throsby, 2001). Its core is to combine cultural values with business models to create new cultural products and promote cultural heritage and innovation. The theory of cultural and creative industries emphasises economic value, cross-border integration and social influence of culture, and promotes sustainable cultural and social development (Hesmondhalgh, 2008). The theory was first proposed by the British scholar Hall, and then with the development of digital technology expanding to new media and other fields, UNESCO also further emphasised its role in promoting economic and cultural diversity (Van der Pol, 2007).

The theoretical study of cultural and creative industries in China started late but developed rapidly. In 2006, the Report on the Development of China's Cultural Industries put forward the importance of cultural industries and analysed the reform of the cultural system and the development of the industry. Chinese scholars have localised the theory of cultural and creative industries in the light of local realities, especially in the protection of intangible cultural heritage by proposing innovative models to both protect traditional culture and enhance its economic value (Lin, 2018; Wang, 2018).

2.2 Current situation of cultural and creative industry of cattail weaving products at home and abroad: In recent years, China's research on cultural and creative industries has focused on creative expositions, design innovation and market promotion. For example, the Blue Book of China's Creative Cities analyses the integration and development of cultural and creative industries around the world, and proposes to promote the revival of traditional handicrafts through branding, design innovation and market promotion. The art of Leizhou cattail weaving was introduced into modern design, and by combining traditional craftsmanship with modern design, it created an exhibition of clothing items with a contemporary feel (Shi et al., 2022). Similarly, the cattail rice in Xishuangbanna, Yunnan has undergone a packaging transformation from traditional to modern, enhancing its cultural value and market competitiveness. Domestic research focuses on the cultural innovation and market expansion of cattail weaving products, and promotes economic development while preserving traditional crafts.

With the development of global creative industries, several countries have combined cultural creativity with environmental design. Saelee et al. (2023) investigated the application of chamois fibre in eco-friendly handicrafts and found that cattail fibre handbags gained high

consumer satisfaction in terms of aesthetics and functionality (Saelee, 2023) Thailand's BOONYARATTHAICRAFTS brand, on the other hand, combines traditional cattail weaving with modern design aesthetics to launch eco-friendly hand-woven products, demonstrating the unique appeal of cattail and other materials in the global creative industry.

3. Research Methodology

1. Literature Review

This research will delve into the cultural value of Leizhou cattail weaving techniques. Through systematic analysis of historical documents, academic papers, and cultural studies, the researcher aims to gain a comprehensive understanding of the unique characteristics of Leizhou cattail weaving and its development in historical inheritance.

2. Field Observation and Research

The researcher will conduct field visits and observations to assess the design quality of Leizhou's cattail weaving creative handicrafts. The focus of the research includes the processing steps of cattail weaving materials, common weaving methods, and the characteristics of local products, with attention to their aesthetics and practicality. The researcher will visit workshops, markets, and design studios in Leizhou, documenting the specific production process of weaving techniques and analyzing their application in innovative design, to gain a more intuitive understanding of the craftsmanship features and development status of Leizhou cattail weaving.

3. Semi-structured Interviews

The researcher will engage in face-to-face interviews with local artisans, designers, and materials experts to gain an in-depth understanding of the integration of Leizhou cattail weaving techniques with modern design. The interview content will cover aspects such as traditional craftsmanship features, material selection, design innovation, market demand, and sustainable development. The goal is to summarize the application experiences and challenges faced in modern creative design, providing valuable insights for future innovative practices.

4. Research Results

1. Leizhou Cattail Weaving

1.1 History and Development of Leizhou Cattail Weaving: Cattail weaving, a traditional craft in Leizhou, Guangdong, dates back to the Neolithic Age. It thrived during the Tang and Song dynasties through maritime trade and peaked in the Ming and Qing periods as a major industry. The Republic of China era saw further growth, but competition led to decline in the 1930s. Innovation revived the craft in the 1960s–70s, yet modern industrial products posed challenges. Today, efforts focus on sustainable development and industrial upgrading, supported by intangible cultural heritage policies, recognizing its environmental, practical, and cultural value.

1.2 Processing procedures of woven cattail materials in Leizhou City: Natural cattail woven material requires a series of laborious processes including harvesting, drying, tsuboflattening, sheath removal, grass splitting and weaving (Chengmiao, 2016). The process of weaving bushy grass-based environmental products is shown in Figure 1. The scientific and systematic nature of the preliminary preparation is crucial to the quality of the final product. Firstly, the harvesting process needs to be carried out based on the physiological maturity of the cattail, which is judged by observing the change in the colour of the grass stems from rich green to bright green or lime green, and the change in the handfeel from soft and smooth to hard and rough. After harvesting, the grass must be cleaned and properly treated to ensure the best quality of the material. Next, the process of sun-drying has a significant impact on the colour and quality of bushes and their economic value. The ideal drying result is a hard, straight stem with a greenish-white colour, which is a key factor in the quality of the weaving. Then, the Tsubaki flattening process is carried out, in which a heavy wooden mallet is used to flatten and soften the moistened cattails to remove the leaf sheaths and make them easier to weave. This is followed by desheathing, or 'stripping the trousers', in which the leaf sheaths at the base of the cattails are carefully removed by flailing and pressing (Liu, 2017). Splitting and sifting are the final steps of the cattail treatment. Grass splitting is the process of sorting the de-sheathed cattails to remove the rotten grasses, and then splitting them neatly into small bunches (Shi et al., 2022). Finally, the screening of cattails is then classified based on length, quality colour and stem thickness. The overall preparation process of the woven cattail-type product is shown in Figure 2.

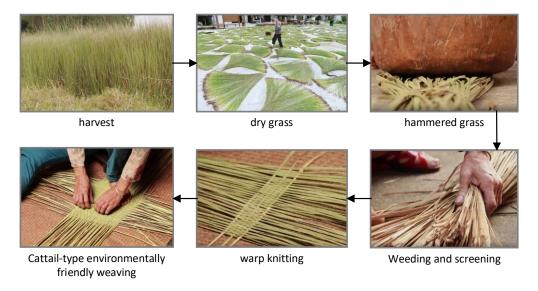
pre-woven stages N aturalCattail pick and ham m ered separate dry grass rem oval M aterial cut grass grass weaving stage plaiting Eco-friendly warp (ie. reprocess knitting woven bushes weaving)

Figure 1: Process of weaving bushy products

Source: Author

Environm ental Standard Requirem ents

Figure 2:Overall Preparation Process of Woven Environmentally Friendly Products made of Cattails

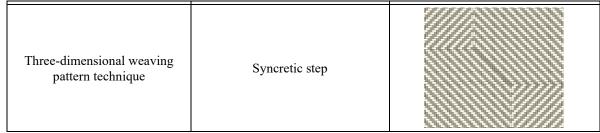


Source: Author

1.3 Common Weaving Methods for Bushel Weaving: Cattail weaving is predominantly executed by hand, with minimal reliance on tools such as flat crochet hooks, scissors, and knives (Xia Wang, 2013). Due to the distinct properties of cattail strands, which are susceptible to damage from tearing or excessive pressure, artisans primarily employ flat weaving techniques, complemented by three-dimensional weaving methods. The process involves interlacing cattail strands in two orientations: longitudinal (warp) and horizontal (weft). By simultaneously manipulating the warp and weft, various interwoven textures are achieved. Cattail weaving techniques are generally categorized into flat and three-dimensional weaving patterns (see Table 1). Flat weaving methods include the pick-one-press-two-thongs technique and the pick-two-press-two-slash technique (Shi Ranran, 2024), while three-dimensional weaving commonly utilizes the mixed-step method for structural formation, colloquially referred to as the "foot flower."

Table 1: Common weaving methods for woven bushel products

Name of knitting technique	Introduction to knitting method	Demonstration of knitting techniques	
Plane weaving pattern technique	Pick one and choose one method of squaring the grid (i.e. to pick one and choose one)		
	The 'pick two and hold two' twill method (math.)		



Source: Author

Leizhou cattail weaving features diverse patterns, including stripes, 'Hui' motifs, city wall designs, chrysanthemum patterns, and character inscriptions. Stripes form by alternating warp and weft interweaving, with adjustable thickness and spacing. The water-wave pattern results from pressing the warp and executing a flat-step weave, while the city wall pattern consists of parallel lines, often used for borders. The 'Hui' pattern combines flat-step and water-wave techniques, resembling the character '回'. The chrysanthemum pattern emerges through fine weaving, expanding outward from the center. Character patterns, such as '囍', convey traditional blessings (Table 2).

Table 2: Leizhou Cattail Weaving Pattern

Name of weaving technique	Demonstration of Weaving Techniques	Physical display picture
Horizontal and vertical stripes		
Water wave pattern (reverse pattern) + Wall pattern (parallel straight line pattern)		
Reversible pattern		
Small chrysanthemum pattern		

Source: Author

2. Application of Leizhou cattail weaving in modern cultural and creative design

Cattail-based eco-friendly products exhibit distinct design characteristics. Their natural yellow and green tones create a fresh, organic aesthetic. Geometric symmetry in form enhances visual simplicity and order. Emphasizing minimalism and elegance, these designs integrate nature with human craftsmanship. The textured surfaces add tactile richness and aesthetic uniqueness. Additionally, the structured interplay of points, lines, surfaces, and volumes creates a rhythmic and harmonious composition. These features define unique aesthetic of cattail weaving, positioning it prominently in modern design by fulfilling both functional and cultural demands (Table 3).

Table 3: Characteristics of the artistic appearance of bushes

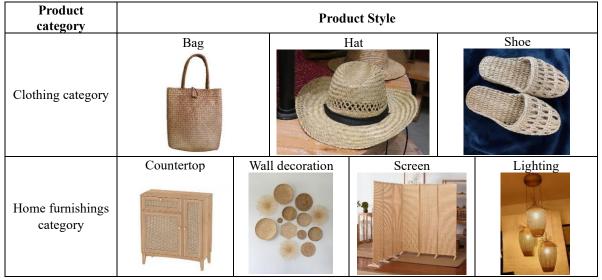
Characteristic	Description		
Color	Subtle and gentle yellow-green tones.		
Appearance	Geometric form with symmetrical shapes.		
Style	Minimalistic, simple, and elegant.		
Texture	Surface with distinct and varied textures.		
Rhythm	Regular variation in the characteristics of points, lines, surfaces, and		
	volumes.		

Source: Author

Environmentally friendly woven bushel products meet modern life's diverse needs through three main categories: daily necessities, apparel, and home furnishings, as outlined in Table 2.In daily necessities, futon mats offer breathability and a cool experience in summer (Efe & Koleva, 2018), while futon fans, with their lightweight and fan-shaped or round designs, provide effective cooling. Futons and storage bags serve as eco-friendly packaging materials and are suitable for daily storage (Fajardo Rodríguez et al., 2021), often in rectangular or cubic shapes. In apparel, woven bags are lightweight, durable, and designed as handbags or crossbody bags (Saelee, 2023). The wide-brimmed futon hat provides sun protection with a natural aesthetic, and push-up shoes, designed as casual shoes or sandals, offer breathability and rain resistance. In home furnishings, woven cabinet decorations, wall hangings, screens, and lamps bring a natural, simple style to the home while enhancing the living space's aesthetics. Cabinet decorations typically feature woven patterns and floral motifs (Chen & Wu, 2018), while wall decorations and screens add dimensionality to space (Chen, 2023). Cattail woven lamps create soft light and shadow effects (Wang, 2021).

Table 4: Cattail weaving product category

Product category	Product Style				
Household goods	Woven mat	Cattail-leaf fan	Pope (merchandise outer packaging)	Bags (storage items)	



Source: Author

3. Challenges of Leizhou cattail weaving in modern cultural and creative design

This research employed a semi-structured questionnaire, with interviews covering six key areas. The first area, Basic Information, examines respondents' backgrounds, areas of expertise, and connections to Leizhou cattail weaving. The second area, Current Status, explores perspectives on the craft's technical level, market conditions, and development trends. The third area, Design Innovation, investigates experiences in integrating traditional techniques with modern design, particularly the use of eco-friendly materials and the challenges associated with this process. The fourth area, Material Selection, analyzes the criteria for selecting sustainable materials and their practical application in cattail weaving. The fifth area, Government Support, assesses policy measures for cultural heritage preservation and industry development, with a focus on attitudes toward incorporating eco-friendly materials. The final area, Future Development, discusses potential innovations and market opportunities for ensuring the craft's sustainability. The findings are summarized as follows:

- 3.1 Dilemma and Development Challenges of Leizhou Cattail Weaving Inheritance: Leizhou cattail weaving, as a local intangible cultural heritage, faces several challenges. Firstly, the craft suffers from a generational gap, with declining interest among younger generations leading to a shortage of skilled successors. Secondly, limited publicity and marketing have resulted in low public awareness, restricting industry growth. Additionally, weak design and innovation capabilities hinder the integration of modern aesthetics and consumer preferences, reducing market competitiveness. While cattail is environmentally friendly, improvements in dyeing and fixation techniques are needed to enhance sustainability. Furthermore, the material's susceptibility to aging affects product durability, limiting its applicability in contemporary markets.
- 3.2 Roles and Initiatives of the Government and Enterprises in the Leizhou Cattail Weaving Heritage: The government and enterprises have implemented various measures to preserve and promote Leizhou cattail weaving. The government supports intangible cultural heritage through protection projects, training programs, promotional activities, and financial aid. It also

encourages local schools to collaborate with artisans, fostering skill transmission and youth engagement. Meanwhile, enterprises integrate traditional craftsmanship with modern design to develop innovative cultural products, enhancing market visibility and competitiveness. While these efforts have contributed to the craft's preservation, further collaboration and innovation are essential for its sustainable development.

3.3 Market Demand and Consumer Preferences: The survey results indicate that Generation Z values environmental sustainability and design innovation in cultural and creative products. Over 80% of respondents expressed willingness to purchase items made from eco-friendly materials, demonstrating strong interest in sustainable products. Young consumers favor small, functional stationery items such as cattail notebook covers, pen holders, bookmarks, folders, and notepads. These products align with environmental trends while integrating modern design for personalization and practicality. Additionally, brand story and cultural significance influence purchasing decisions, as consumers prefer products with cultural value. Price sensitivity is also a key factor, with young consumers favoring cost-effective options. Therefore, pricing strategies for cattail stationery must balance affordability with production costs.

3.4 Future prospects: With the increasing global emphasis on cultural heritage preservation, Leizhou cattail weaving faces new opportunities for development. Firstly, it can not only gain wider attention through cultural tourism and museum exhibitions, but also enter a larger market through innovative design. Secondly, the biodegradability and low carbon footprint of bushy straw weaving is highly compatible with the current environmental protection trend, which wins a competitive advantage in the market of environmentally friendly products. Combined with the core concept of cultural and creative industries - 'culture + creativity + industrialisation', the combination of modern design concepts and traditional craftsmanship not only brings innovation in aesthetics and functionality of dandelion weaving products, but also provides a new development direction for branding, market positioning and consumer experience. The combination of modern design concepts and traditional craftsmanship not only brings aesthetic and functional innovations to the products, but also provides a new development direction for branding, market positioning and consumer experience. Through cross-border cooperation, material innovation and personalised customisation, cattail weaving products can better meet the needs of modern consumers and enhance their market competitiveness. Finally, with the popularity of e-commerce platforms, the promotion of Leizhou cattail weaving products through online channels not only expands consumer groups, but also provides a new path for customised services. These initiatives fully reflect the application of the principles of cultural and creative industries in the design of cattail weaving and provide a broader space for its future sustainable development.

5. Conclusion

This study explores the application of Leizhou cattail weaving in modern creative design and the challenges it faces. Leizhou cattail weaving has a deep cultural heritage and unique craft value, but its application in the modern market faces the challenges of insufficient market adaptability and low production efficiency. The combination of cultural and creative

industries and green materials provides a new path for the innovative development of traditional handicrafts. Through creative design, traditional cattail weaving skills can be transformed into innovative products with cultural connotations and environmental attributes in the modern market, which can satisfy the dual demands of contemporary consumers for functionality and aesthetics. Sustainable development is at the core of the future development of Leizhou cattail weaving, which requires the industry to focus on the combination of innovative design and green materials on basis of inheriting traditional craftsmanship in order to improve the overall competitiveness and environmental value of the industry.

However, how to retain the cultural connotations of traditional craftsmanship in the innovation process and maintain environmental requirements while enhancing production efficiency remains a pressing challenge. Future development will require multi-party cooperation between the industry in terms of design innovation, material application and marketing, etc., so as to promote cattail weaving to find a balance between cultural heritage and market demand. Overall, the sustainable development of Leizhou cattail weaving relies on further exploration in the combination of innovative design and green materials.

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