

PROTECTION AND DEVELOPMENT OF SILK MANUFACTURING
INDUSTRY IN KHON KAEN, THAILAND CREATES COMMERCIAL
ADDED VALUE

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Abstract

Purpose: Thai silk is a world-famous textile. This study mainly explores the protection and development model of silk patterns in Khon Kaen Province to improve the commercial value. **Methods;** Qualitative research and quantitative research were used to design questionnaires and interview questionnaires. Twenty people including 6 textile manufacturers, government officials and researchers from Chonnabot District, Mancha Khiri District, Ban Phai District and Phra Yuen District of Khon Kaen Province were selected as interview research subjects. **Questionnaire:** 150 heads of silk companies were selected to fill in the design questionnaire online, and data triangulation and descriptive statistics were used to obtain the research results. **Results:** The influencing factors can jointly explain 35.60% of the variation in silk pattern protection and manufacturing development ($R^2= 0.356$, $p\text{-value} = 0.000$), indicating that these factors have significant overall predictive power for silk pattern protection and manufacturing development. **Significant predictors:** at the 0.05 significance level, the application of modern technology: its stan-

standardized coefficient $B=0.215$, $p\text{-value}=0.007$; protective measures: standardized coefficient $B=0.225$, $p\text{-value}=0.005$; the development of manufacturing industry : Standardized coefficient $B=0.195$, $p\text{-value}=0.008$. Non-significant predictors: marketing and sales strategy: standardized coefficient $B=0.105$, $p\text{-value}=0.189$; support from government and related organizations: standardized coefficient $B=0.112$, $p\text{-value}=0.214$. Conclusion: The application of modern technology, protection measures, and manufacturing development significantly affect silk pattern protection and manufacturing development, while marketing strategies and support from governments and related organizations have no significant impact.

Keywords: Khon Kaen Silk, protection and development, added value

Introduction

Silk is the "queen" of natural fibers, known for its unique qualities: softness, high fineness, pleasant and delicate touch, higher resistance than steel wire, elegant and shiny appearance. It is an environmentally friendly and skin-friendly product, and is processed into silk fabrics (Popescu, A., Serban, V., & Ciocan, H. N, 2024).

Isan (Northeastern Thailand) textiles are cultural treasures Sawatdi, K., Yodmalee, B., & Paengsoi, K. (2013)., showing the unique life of Thai people from the past to the present, through the intricate weaving patterns, colors and different production techniques. Most of the producers are ethnic groups from outside Thailand who moved to Northeast Thailand and passed on their cultural heritage to the next generation. This is true for all regions of Thailand and continues their traditions and local knowledge in textile

fabric production. Today, it is difficult to distinguish the differences between the numerous weaving patterns of different communities, but different characteristics still exist and are unique to each ethnic background (Sawatdi, K., Yodmalee, B., & Paengsoi, K. 2013) . The art and skills of making silk textiles have been sought after since ancient times.

Sericulture is a profitable agricultural-based employment system that attracts most of the rural population and improves the economic development and status of rural communities in addition to creating employment opportunities (Singh, K., & Bhargava, J, 2023). Since 1902, the central government has given great attention and support to silk farmers to expand sericulture and improve the quality of silk textiles, replacing support for imported silk from Japan. It was terminated in 1907 due to an agricultural epidemic that destroyed local silkworm farms across Thailand. Although public

support was inconsistent at first, local communities produced silk textiles based on available resources, providing an alternative source of income for many individuals and families. Initially, production purposes were limited to intra-family use and intra-community trade, and commercial enterprises only began to operate when there was a surplus of silk fabrics (Sawatdi, K., Yodmalee, B., & Paengsoi, K. 2013).

Thai silk is the finest fabric available to consumers today. In the past, foreigners knew little about Thai silk because the fabric was unpopular with most local residents, who considered it a textile that only high-class and wealthy individuals could own. It was not until after World War II that American entrepreneur Jim Thompson made Thai silk popular around the world. The popularity of Thai silk was supported by Her Majesty Queen Sirikit of Thailand, who established the Royal Folk Arts and Crafts Center to support local Thai culture (Tamrongterakul, S., & Ocha, W, 2021).

Mat-mee silk pattern is a unique traditional dyed silk that represents the cultural identity of the northeastern Thai community and is only worn during special occasions such as traditional festivals and weddings. The Isan community reveres mat-mee silk (Kanchaya Jantarungsee, 2024).

Textiles are a symbol of status and reveal the nature and wealth of a family. The high psychological value placed on mati-mee silk promotes the continued inheritance of individuals and families in the Isan region, where elders preserve their native heritage and skills and pass them on to younger generations (Dalferro, A. G, 2021) . The purpose of this study is to explore the development model of creating added value for silk patterns in Khon Kaen province.

Research Methods

This study used qualitative and quantitative research to study (1) the history of silk patterns and designs in Khon Kaen Province, Thailand. (2) the protection and development of silk pattern manufacturing in Khon Kaen Province to create added value. The research period was from March 2023 to June 2024. Interviews and questionnaires were used to interview 20 people from six silk textile manufacturers, government officials and researchers in Chonnabot, Mancha Khiri, Ban Phai and Phra Yuen Districts of Khon Kaen Province . They included 8 traditional silk manufacturing craftsmen; 5 silk merchants; 3 cultural protection officers; 2 scholars and researchers; and 2 others. Literature related to silk textiles, protection, and creating added value was searched, and research data was collected on the spot through surveys, observations, interviews and work discussions. Data

triangulation was used to analyze the research data, and descriptive analysis was used to present the research results. The questionnaire was selected from 150 silk enterprise managers to fill in the questionnaire online, including 45 large enterprises and 105 small and medium-sized enterprises. 160 questionnaires were sent out, and 151 valid questionnaires were received. The questionnaires were an-

swered well, with an efficiency of 100%. A 5-level Likert attitude measurement scale and multiple-choice questions were used. The score for each option was: "very satisfied" 5 points, "somewhat satisfied" 4 points, "averagely satisfied" 3 points, "not very satisfied" 2 points, and "very dissatisfied" 1 point.

Table 1. Regression analysis

	Unstandardized coefficient		Standardized coefficient		
	B	Standard error	Beta	t	p
constant	0.968	0.198		4.895	0
Application of modern technology	0.215	0.227	3.145	-1.935	0.007
Protective measures	0.225	0.068	-0.007	-0.101	0.005
The evolution of manufacturing industry	0.195	0.069	0.206	2.723	0.008
Marketing and sales strategy	0.105	0.052	0.05	0.916	0.189
Support from the government and relevant organizations	0.112	0.047	0.576	12.769	0.214
R ² □	0.356				

Dependent variables: Silk pattern protection and manufacturing development

* p < 0.05 ** p < 0.01

Results

Results of regression analysis: The above factors can jointly explain 35.60% of the variation in silk pattern protection and manufacturing industry development ($R^2 = 0.356$, $p\text{-value} = 0.000$), indicating that they have significant overall predictive ability for silk pattern protection and manufacturing industry development.

Significant Predictors

At the significance level of 0.05, the following three factors have significant predictive power for silk pattern protection and manufacturing development:

Application of modern technology: Its standardized coefficient $B=0.215$, $p\text{-value}=0.007$, indicating that the application of modern technology has a significant positive impact on the protection of silk patterns and the development of the manufacturing industry.

Protection measures: Its standardized coefficient $B=0.225$, $p\text{-value}=0.005$, indicating that protection measures have a significant positive impact on silk pattern protection and manufacturing development.

Development and changes in the manufacturing industry: its standardized coefficient $b = 0.195$, $p\text{-value} = 0.008$, indicating that the development and changes

in the manufacturing industry have a significant positive impact on silk pattern protection and manufacturing development.

Non-significant Predictors

Market and sales strategies: The standardized coefficient $B=0.105$, $p\text{-value}=0.189$, indicating that the impact of market and sales strategies on silk pattern protection and manufacturing development is not significant.

Support from the government and related organizations: Its standardized coefficient $B=0.112$, $p\text{-value}=0.214$, indicating that the support from the government and related organizations has no significant impact on the protection of silk patterns and the development of the manufacturing industry.

Discussion

Matisse Textiles Are A Unique Product

Khon Kaen is currently the most important producer of commercial silk textiles. There are many production centers, the most famous silk textile production center is in Chonnabot District (Sawatdi, K., Yodmalee, B., & Paengsoi, K. 2013). The silk textiles produced in Chonnabot are usually mat-mee silk textiles or mat-mee patterns, which are a unique product that has been passed

down through many generations. Evidence of the importance of Khon Kaen silk textiles are the awards given to Khon Kaen silk producers by many regions and countries. The history and development of Khon Kaen silk patterns can be divided into two periods, before 1976 and after 1976, when many changes occurred in the manufacture of silk textiles.

The origin of the patterns on Khon Kaen mat-mee silk textiles is still under debate, with no concrete evidence pointing to the original creator or creators of the unique patterns. Scholars generally agree that mat-mee patterns have been passed down through many weavers from generation to generation and are the indigenous knowledge, culture and heritage of the Isan community. Traditional silk patterns require memory and oral transmission, while modern patterns can be mass-produced through graphic paper and computer graphic design.

Traditional silk weaving patterns are passed down from generation to generation and mimic their environment, with most ethnic textile patterns, including mat-mee patterns, being influenced by nature and the community environment. In 1976, commercial production of silk textiles was introduced to promote innovation and incorporate new patterns and styles into the traditional mat-mee

pattern. Different weaving techniques and a wider variety of colors were experimented with to create new patterns based on traditional outlines. Many innovations came from what producers and weavers saw on television, fashion magazines, newspapers, and were inspired by suggestions from customers and contractors. For example, a unique pattern emerged from the influence of the Sawan Biang TV series and became very popular locally. This pattern is called lai sawanbiang.

Sometimes mati-mee patterns were named after the client who ordered the design, such as Madame Louis. Post-1976 textile pattern design was a contribution made through trial and error using imaginative techniques. Many designs were simply test patterns, undocumented and kept in storage for further study and development. Today's designers often use graph paper and computer-aided drafting to help design, modify and store their patterns and techniques. A new generation of textile manufacturers has increased their reliance on CAD software and graph paper, which is more efficient than memorizing patterns and techniques. Although drawings have been widely used by many weavers in the past, the drawings are not exactly proportional to the actual silk thread proportions. CAD software has further improved production efficiency, and the final product closely matches the

design (Figure 1).

Matisse Textile Pattern

Classical silk patterns originated from direct modeling of plants, animals and nature, while contemporary silk patterns imitate media such as television, multimedia, publications and customer orders. Silk textile production materials use traditional domestic silk thread, and the output of local silk thread has been declining because the natural pigment and consistency of the silk thread are limited. Now, silk thread is purchased from the factory on spools, and modern silk thread is available in a variety of colors and standard sizes. Thai weaving is a priceless cultural heritage, and each piece embodies colors and patterns, conveying people's unique insights into lifestyle (Wongsawangisiri D, Wechk T, 2024).

Protection and Development of Silk Fabric Patterns

Silk textiles offer consumers a wide variety of designs and patterns, and most items for sale are usually dyed with colorful synthetic pigments. Natural dye silk textiles are rarely displayed and can only be ordered in some stores. The market trend has shifted to organic and natural pigments. Consumers are returning to the trend of classical styles. They tend to buy traditional food and handi-

crafts for their own consumption or as gifts for relatives and friends, and sell to local and international tourists, providing producers with opportunities to expand their product lines. These increased demands mean that traditional and innovative silk textile patterns can provide added value and create another source of income for local artisans and communities (Zhou, X., Mayusoh, C., Inkuer, A., & Puntien, P, 2024).

Handmade silk textiles are healthy, environmentally friendly and valuable. Mat-mee silk textiles are an identity of Khon Kaen and are designated by the Ministry of Commerce as an intellectual cultural asset of the local community. Therefore, it is prudent to continue to develop and sell a product that is based on tradition but is more diverse, innovative and value-added. Newly produced silk textiles need to be tested, and test products transform traditional textiles into consumer goods such as handbags, wallets and clothes. The patterns used in test products rely on basic textile patterns, and each producer has its own unique patterns, colors and decorations. As technology develops, more efficient materials and processes are applied to replace unreliable tools and materials (Jantarungsee, K., Plengdeesakul, B., & Pengchai, T, 2024). These innovations improve production efficiency, increase output, save time, and reduce the resources traditionally required. As shown

Figure 1. Application Of Computer-Aided Design Software In Matisse Fabric Design



Figure 2. Khon Kaen Silk Textile Testing Products



Figure 3. The Unique Model Of Silk Textile Producers In Khon Kaen

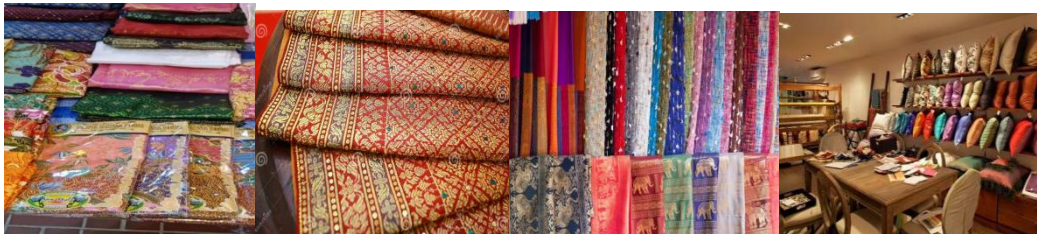


Figure 4. Innovative Products Based On Traditional Mati-Mee Silk Textiles



in (Figure 2).

In the workshops by textile experts and producers. Providing greater flexibility to producers, expanding the silk textile landscape, producing more innovative products, maintaining traditional values while creating added value and being commercially viable. The products produced are initially displayed and sold at the local handicraft exhibitions held annually by the Ministry of Commerce, and gradually expanded to exhibitions and sales across the country (Komon-sirichok, Y., Sutakom, O., & Mitpaeng, T, 2024).

The mat-mee production groups in this study were established for an average of about 39 years. The managers or leaders of each mati-mee group started by learning the same basic model and gradually increased their production and members. Although each group has the same basic model and design, the manager or leader of each group must ensure that at least one model and design is unique, which is in line with the view that leaders play a key role in the organization of textile groups (Kaenpromma, N., Mayusoh, C., Pornmutawarong, T., Sadsunk, S., Samleethong, S., Juysukha, S., & Khrongyuth, W. 2024), and its success depends on the uniqueness of the chairman or member responsibilities and products. The production failure team lacks clear bounda-

ries of responsibility within the organization and lacks structural management, resulting in a lack of creativity and diversity in products.

Development Of Silk Weaving Manufacturing Industry In Khon Kaen Province

Many people who make mat-mee still use traditional tools, but there have been great improvements, from wooden tools to metal or steel-reinforced tools. Dyeing and weaving machines have replaced the traditional hand-cranked spindles, improving the efficiency of silk dyeing, winding and other transformations. The preservation and survival of culture requires development and innovation to be inherited by future generations. Adding or modifying innovative products must be compatible with traditional characteristics and useful to community members.

Most of the silk threads produced began to return to local production and were mixed with silk threads purchased from factories according to customer orders. The pigments gradually changed from 1976. Before that, traditional silk thread dyeing was to collect silk threads together and process them in batches. The colors were monotonous and only black or navy blue. The pigments were also natural dyes of black, dark blue, green, yellow and red. Dyeing relied on traditional techniques and simply painted

the threads with available colors. Traditional weavers faced the problem that natural dyes were easy to wear and the colors were limited. From 1958 to 1975, natural dyes were popular (Duraismwamy, D., 2024). After 1976, due to the popularity of synthetic pigments, modern weavers had more flexibility in choosing colors. They were easy to use, dried quickly, and did not fade easily after washing and daily use, which greatly enriched the variety of silk textiles.

Many manufacturers prefer synthetic pigments, but the decision depends on the customer's order. Combining traditional raw materials with synthetic materials to reduce production time, sometimes traditional and natural materials are also chosen because some customers prefer organic and chemical-free materials, which is reflected in traditional silk textiles using traditional methods and natural substances.

To support the development and value addition of the silk textile market, textile models have been greatly improved. The silk textile model in Khon Kaen is diverse and has many names, independently named by producers in each community. Most textiles are produced as commercial fabrics, and only a few process their fabrics into useful items such as clothing and handbags. The number of producers who only produce textiles exceeds those who expand

their product lines into souvenirs and other useful products. Transformed Silk textile producers, who usually focus on silk clothing as their main product, realize that the sale of textiles is seasonal, territorial, and limited to consumers who want to make their own clothing or buy it as a gift. Few producers realize that offering a diverse range of products will greatly help increase sales and profits. The findings are consistent with research conducted by the Public Relations Department of the Khon Kaen Provincial Government, which shows that the number of silk souvenir and clothing producers in Khon Kaen is still very limited (Jantarungsee, K., Plengdeesakul, B., & Pengchai, T, 2024).

Support From Governments And Organizations

The government office offers financial support to businesses, but there has been little response from local producers. They follow guidelines and support the program only when funding is available. When public funding runs out, producers stop producing products recommended for the commercial market, such as silk vases, silk flowers, and silk lamps. Direct reproduction of traditional models of silk textiles remains mandatory and a direct method of cultural preservation, which can be greatly enhanced by increasing innovation and creating added value (Fund, ULMCS

2020) .

Consumers will accept traditional items at first, but will change their minds over time. People are always looking for new and fashionable things, and it is the responsibility of textile manufacturers to meet their needs. This can be achieved by producing traditional and innovative products based on the original characteristics, adding new features, functions and technologies such as e-commerce (Wisansakkul, S., Egwutvongsa, S., & Seviset, S. 2024). By incorporating new ideas, technologies and marketing methods into traditional designs, producers can sell products at higher prices (Lim, MK, & Chuangchai, P.2023).

Conclusions

The results show that the application of modern technology, protection measures and the development and changes of the manufacturing industry significantly affect the development of silk pattern protection and manufacturing; while market and sales strategies, and the support of the government and related organizations have no significant effect.

Khon Kaen patterns and designs can be achieved through innovation, but it is necessary to adhere to and imitate the traditional background. The development of new textiles using modern technology must be in line with tradition

and meet the needs of customers. Consideration must also be given to product diversity in order to be different and unique from other producers. The development of Thai silk manufacturing requires technological and tool improvements, design diversification, and high-end market positioning to promote to the international market. It is a development method based on moderation, harmony, and caution, and a business development model based on knowledge and virtue. (Charungkiattikul, S., & Joneurairatana, E, 2021)

Recommendations

The protection and development model of silk fabrics can be directly applied by manufacturers in creating added value benefits, and the continuous development of innovative technologies will greatly improve the production and sales of silk textiles. Topics that need to be expanded should include detailed production processes, production tools, traditional and modern raw materials, and the design of textile patterns. Provincial administrative departments should provide support and assistance, increase financial investment, provide technical training, cooperate with planning departments on research results, strengthen market promotion, and strengthen international cooperation to increase their income. Print, radio and television media journalists should increase coverage of

the history, protection and development of local silk fabrics, provide impetus for the protection and development of silk textile patterns in Khon Kaen Province, and contribute to the creation of commercial added value for the protection and development of Khon Kaen's silk manufacturing industry.

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