Application of traditional knowledge to create indigo-dyed fabric products in Sakon Nakhon Province, Thailand

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Abstract *– Indigo fabric is created by dying silk or cotton with color from the true indigo plant (Indigofera tinctoria) and is a valuable commodity in Northeastern Thai communities. This is a qualitative investigation with two principal research aims: 1) To study the history and background of indigo-dyed fabric in Sakon Nakhon Province; 2) To study the current conditions and application of traditional knowledge in creating indigo-dyed fabric in Sakon Nakhon Province, Thailand. Data for this investigation were collected from document analysis and field research between July 2013 and July 2014. Results show that weaving groups are sponsored by the government and the local community to produce indigo-dyed fabric that can be transformed into a variety of different products that meet consumer needs. These products include blankets, scarves, shawls, formal wear and bags. Weaving communities prefer to use materials from the surrounding environment. Community members cultivate their own true indigo plants using the traditional processes inherited from generation to generation. The dye creation process requires plant matter to be soaked in water for 24 hours before it can be used in the dye mixture. The traditional dye mixture is 4 liters of indigo plant, 2 liters of natural lye water and 1 tablespoon of white lime. During the dyeing process, the cotton fabric is stirred and wring in the dye mixture until the color holds. The fabric is then rested and the process is repeated to achieve the desired hue. The quality of the dye is then tested by washing the fabric in clean water. By applying the resourcefulness of traditional knowledge used in the dye creation process to the marketing and sale of indigo fabric, the entire production will benefit.*

Keywords *– Indigo fabric, Northeastern Thailand, traditional knowledge, weaving.*

INTRODUCTION

In order to develop the domestic economy and as a reaction to the global economic crisis, the Thai government has placed an emphasis on the support of local industry and handicrafts. This policy of localism is consistent with the national economic principal of the "sufficiency economy" introduced by His Majesty King Bhumibol Adulyadej and has also been integrated with the tourism and export sectors [1]. Traditional Thai knowledge has evolved over the centuries out of human interaction with the local environment and response to basic needs. One particularly large category of traditional Thai knowledge is clothing [2]. This category of traditional Thai knowledge can be sub-divided by region and ethnic group. In Northeastern Thailand (Isan) there is a large ethnic Tai-Lao presence. These groups have inherited the traditional weaving knowledge of their ancestors and use it to produce a number of unique and beautiful fashions.

Indigo fabric is created by dying silk or cotton with color from the true indigo plant (Indigofera tinctoria). This plant has been used worldwide for over 6000 years to dye fabric but the techniques used to dye and create clothing differ from place to place. The history of traditional indigo clothing in Thailand has not been well documented and the practice disappeared fifty years ago [3]. A revival was started in 1992 in Sakon Nakhon Province, a province in upper Isan which was an ideal location for quality indigo clothing due to the abundance of true indigo plants. In addition, the households of Sakon Nakhon had retained traditional knowledge of indigo-dying techniques and weaving patterns. Given the importance of Sakon Nakhon Province to the indigo fabric industry and the government emphasis on localism, the researchers were interested in analyzing the application of traditional knowledge to create indigo-dyed fabric products in Sakon Nakhon Province, Thailand.

OBJECTIVES OF THE STUDY

This is a qualitative investigation with two principal research aims: 1) To study the history and background

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of indigo-dyed fabric in Sakon Nakhon Province; 2) To study the current conditions and application of traditional knowledge in creating indigo-dyed fabric in Sakon Nakhon Province, Thailand.

MATERIALS AND METHODS

Data for this investigation were collected from document analysis and field research between July 2013 and July 2014. Weaving communities in Sakon Nakhon Province were purposively selected to comprise the research area for this investigation. Communities chosen were Ban Tam Tao, Ban Bawa, Ban Don Goi, Ban Na Dee, Ban Panna and Ban Ton. Criteria for research area selection were as follows: The community was in Sakon Nakhon Province; The community had inherited traditional knowledge of indigo fabric dying and weaving techniques; The community contained continuously operating indigo-dyed fabric production groups; and the community supported indigo-dyed fabric production and application of traditional knowledge to create a community economy.

The research population was taken as individuals from these six communities. The research sample was purposively selected and individuals were divided into one of three groups: key informants, casual informants and general informants. The key informant group was composed of a provincial development officer, a provincial agricultural officer, three district community development officers, three district agricultural officers, six sub-district administrators, six weaving group chairmen, six local indigo-dyed fabric experts, two designers and two sales representatives. There were 30 key informants. The casual informant group was composed of 10 production group members from each of the six communities, totaling 60 individuals. The general informant group consisted of 10 consumers, 10 tourists and 10 general government officials. There were thirty general informants.

Data collection tools used in the field were participant and non-participant observation, structured and unstructured interview, focus group discussion with 6-12 participants and a workshop. All data were validated using a four-stage triangulation method: data triangulation, investigator triangulation, theory triangulation and methodological triangulation [4]. The data were categorized according to the three aims of the research and analyzed by analytic induction and typological analysis. The results are presented here as a descriptive analysis.

RESULTS AND DISCUSSION

The indigo fabric of Sakon Nakhon is woven from cotton and dyed using color from the true indigo plant (*Indigofera tinctoria*). Originally, indigo-dyed clothing was produced for use in the household and for work in the fields. In 1998, the indigo-dyed fabric of Sakon Nakhon generated high interest and its production was sponsored by the Office of Community Development. This initiative was also supplemented by a team of academic researchers from the Sakon Nakhon Rajabhat University. The research team trained local weavers in traditional production techniques, clothing design and marketing, helping to distribute the indigo-dyed fabric of Sakon Nakhon to other provinces across Thailand. In 2005, the indigo-dyed fabric of Sakon Nakhon was popular internationally as well as domestically, which saw its elevation to OTOP status, a nationwide program to promote one traditional product in each sub-district. It is a product that sells well and can generate considerable income for the local community.

Each weaving group investigated during this research was sponsored by the government and the local community to produce indigo-dyed fabric that can be transformed into a variety of different products that meet consumer needs. These products include blankets, scarves, shawls, formal wear and bags. However there is insufficient budget to continually produce such a variety of products.

Weaving communities prefer to use materials from the surrounding environment. Community members cultivate their own true indigo plants using the traditional processes inherited from generation to generation. In the past, cotton was also grown by the weavers. However, the nurturing of cotton plants requires patience and care and often the yield is insufficient for indigo-dyed fabric production. As a result, modern weaving communities purchase cotton fabric from wholesalers or directly from cotton mills. The equipment used in the weaving process is the same as in the past because indigo-dyed fabric is still produced by hand in the communities studied. The equipment used in the weaving process is a wooden-framed handloom, a beater to push the weft of yarn in place, a heddle to separate the warp threads, a shuttle and a reel. Over time, the weaving equipment has deteriorated and there is a lack of skilled artisans to repair the tools and create new ones.

The patterns used in the creation of indigo-dyed fabric have been developed from traditional designs to be more modern. Consumers prefer designs that tell a story and relate to the events at which the fabric is worn as clothing. Some examples are the *lai ruea fai* pattern, which is worn at the annual *lai ruea fai* festival in the communities along the Mekong River, and the large Naga pattern worn at auspicious events (Figure 1).

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A – *Nak son song chan*

B – *Nok nang aen*

C - *Nak*

D – *Bla tong*

Figure 1. A selection of modern indigo-dyed fabric patterns.

The process to prepare indigo plants to create indigo fabric-dye is an example of traditional knowledge that has been passed on in the weaving communities from generation to generation. The true indigo plants are planted in April and take about four to five months to reach maturity. At the end of the growing period, the entire plant, branches and leaves, is harvested and soaked in water for 24 hours or 2 nights. However, in the hot season, the plants should not be soaked for more than 20 hours. One large earthen pottery jar is used to soak about 20 kilograms of plant matter. 400 grams of lime is added to every 80 litres of indigo water to counteract the odour. The colour of the lime also affects the final colour of the dyed fabric. For a lighter colour, white lime is added. For a darker colour, red lime is added. The indigo plants are beaten in the water for half an hour and allowed to rest. The froth created by beating the plants will be a shade of dark blue. After the plants have been removed, approximately three kilograms of dyed water will remain. The sludge is separated from the water and used to create fertilizer because it acts as a pesticide against crabs and shellfish in the rice paddies. Excess water is used to water plants in the kitchen gardens of the weavers because it acts as a pesticide. The plant matter is then stored in sealed containers. If kept in a controlled atmosphere, the plant matter can last for up to two years and used in dye recipes. One key element of traditional knowledge used

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in the dyeing process is the inclusion of tamarind paste in the water. This acts to make the dye more durable and keep the colour bright.

The dye recipe is 4 litres of indigo plant, 2 litres of natural lye water and 1 tablespoon of white lime. These ingredients are put in a clay pot and diluted with the water used to soak the indigo plants. The mixture is combined and allowed to rest. Over the course of 10-15 days, a little lime is added to the mixture daily. Once the mixture has a pleasant odour and is a green/yellow colour and the froth is a deep shade of blue, the dye is ready for cloth. A grey-coloured mixture is a sign of decay. This can be remedied by adding 50 grams of tamarind paste and one tablespoon of lime.

Before dyeing, the fabric must be thoroughly cleaned and wringed out. The individual cloths are separated and dipped in the dye mixture. The cloths are stirred and wrung in the dye (Figure 2) until the colour has transferred and they are removed from the dye after five minutes. Once the cloth and dye mixture react with the oxygen in the air, the colour will intensify. The process is repeated until the desired hue is achieved. After the dyeing process, the colour retention quality of the dyed fabric is tested before the products can go on sale. To test the colour, fabric is washed in clean or soapy water until no dye escapes from the cloth (Figure 3). Once the fabric colour has been successfully tested, the indigo-dyed fabric is transformed into products for sale.

Figure 2. Wringing the cloth in the indigo dye mixture.

Hand-woven fabric dyed from the true indigo plant is a product that has been developed through centuries of inheritance. The products can now be considered an important cultural heritage of North-eastern Thai people.

Figure 3. Colour evaluation by washing fabric in clean water.

The traditional knowledge used in the process, from plant cultivation to product sale, maximises the use of every resource, such as the creation of pesticides from the excess dye water. This is an example of Malinowski's [5] conception of functionalism. Malinowski argued that culture served basic human needs, which is the case in the dyeing process in Northeastern Thailand. The continued use of traditional knowledge has added value to the fabric products as souvenirs and examples of cultural heritage. In an analysis of bamboo handicrafts in Phitsanulok Province, Kunmala [6] found that consumers were more attracted to traditionally created souvenirs because they were unique and they offered the chance for buyers to help conserve traditional Thai heritage. The traditional knowledge used in creating indigo-dyed fabric clothing makes the most use of natural resources. This is an important feature of traditional knowledge in Thailand in general [7] and is a common trait of traditional clothing methods around the world, as shown by research in China [8], New Zealand [9] and Turkey [10].

CONCLUSION AND RECOMMENDATION

The indigo fabric industry is an important cottage industry for local communities in Sakon Nakhon Province and follows the government policies on localism. Analysis of the application of traditional knowledge to create indigo-dyed fabric products found that indigo-dyed fabric products first became considered a commercial product in 1998. Business is supported by the status of indigo-dyed fabric as a government recognized OTOP product. The traditional knowledge used in dye creation has been passed down from generation to generation and begins with the cultivation of the true indigo plant (Indigofera

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tinctoria). Each resource in the process is maximized, such as by creation of pesticides from the dye water. The dye creation process requires plant matter to be soaked in water for 24 hours before it can be used in the dye mixture. The traditional dye mixture is 4 liters of indigo plant, 2 liters of natural lye water and 1 tablespoon of white lime. During the dyeing process, the cotton fabric is stirred and wring in the dye mixture until the color holds. The fabric is then rested and the process is repeated to achieve the desired hue. The quality of the dye is then tested by washing the fabric in clean water.

As the steps of the dyeing process are passed on by word-of-mouth, the researchers recommend that more concrete notes and records are made to prevent the disappearance of this valuable knowledge. Further research should be undertaken to consider the conditions required to successfully cultivate the true indigo plant. This will enable the weaving communities to apply scientific knowledge to their practices and generate greater yield from their crops. The office for community development should organize training and seminars for the weaving communities to exchange knowledge, develop dyed products and add value to the community economy in Northeastern Thailand. Further research should also consider the design, marketing and sale of transformed indigo-dyed fabric to discover ways to generate more income for the weaving communities. Finally, further investigation should consider ways in which the dyeing process can be standardized. Either greater funding should be allocated to the weaving communities or the variety of products created should be reduced. By applying the resourcefulness of traditional knowledge used in the dye creation process to the marketing and sale of indigo fabric, the entire production will benefit. With these changes valuable indigo fabric dyeing can be protected in modern society.

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