การจัดการความรู้ของกลุ่มกิจการพัฒนาเศรษฐกิจชุมชน: กรณีศึกษากลุ่มย้อมหม้อห้อม อำเภอเมืองแพร่ จังหวัดแพร่*

ณธษา พันธ์บัว[1] ทอแสง หงษ์คำ[2]

(วันที่รับบทความ: 11 มกราคม 2568; วันแก้ไขบทความ: 26 เมษายน 2568; วันตอบรับบทความ: 30 เมษายน 2568)

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์ 1) เพื่อศึกษาและจัดทำการจัดการความรู้กลุ่มกิจการพัฒนาเศรษฐกิจชุมชนสำหรับการย้อมห้อม อำเภอเมืองแพร่ จังหวัดแพร่ และ 2) เพื่อเผยแพร่ความรู้การย้อมห้อมและการประเมินผลจากชุมชนที่มีความต้องการการย้อมห้อม มีวิธีการดำเนินงานได้แก่ การเก็บรวบรวมข้อมูลโดยวิธีการสัมภาษณ์เชิงลึกสัมภาษณ์ผู้เชี่ยวชาญประจำชุมชน จำนวน 5 ชุมชน การเผยแพร่ความรู้จากการย้อมห้อมโดยการประชุมชุมชนด้วยการจัดทำเอกสารเผยแพร่ความรู้ด้านการย้อมห้อม ตรวจสอบความถูกต้องจากผู้เชี่ยวชาญจำนวน 3 ท่าน การประชุมชุมชนจากประชาชนมีความสนใจในการย้อมห้อมจำนวน 30 คน และติดตามผลการนำความรู้ไปใช้ประโยชน์ของชุมชน

ผลการศึกษาพบว่า การจัดการความรู้กลุ่มย้อมหม้อห้อม แบ่งได้ 3 ขั้นตอน ได้แก่ 1) การเตรียมห้อมเปียกประกอบด้วยขั้นตอนการเตรียมใบห้อม การทำน้ำด่างจากปูนขาว และการหมักห้อม 2) การย้อมห้อม ประกอบด้วยการก่อหม้อห้อม และการเตรียมวัสดุก่อนการย้อม และ 3) การย้อมสีจากห้อม การติดตามผลการนำความรู้ไปใช้ประโยชน์ของชุมชน พบว่าประชาชนสามารถนำความรู้ไปใช้ประโยชน์คิดเป็นร้อยละ 90 หัวข้อที่ได้รับความรู้และความเข้าใจเพิ่มขึ้นมากที่สุด ได้แก่ ขั้นตอนการเตรียมใบห้อม รองลงมาคือการหมักห้อม และการทำน้ำด่างจากปูนขาว ตามลำดับ ประโยชน์จากการเข้าร่วมประชุม ได้แก่ ทำให้รู้จักวิธีการย้อมห้อม สามารถนำไปปฏิบัติได้จริง ได้รับความรู้เพิ่มเติมเรื่องการปลูกห้อมและการเก็บเกี่ยว ความรู้ที่ได้รับสามารถนำไปเผยแพร่ต่อได้ และจุดประกายให้การย้อมผ้าจากห้อมสามารถผลิตใช้เพื่อใช้ในครัวเรือนได้

คำสำคัญ: การจัดการความรู้, กลุ่มกิจการพัฒนาเศรษฐกิจชุมชน, การย้อมห้อม, สีย้อมธรรมชาติ

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* งานวิจัย สาขาคหกรรมศาสตร์ คณะศึกษาศาสตร์ มหาวิทยาลัยรามคำแหง, 2565

[1] อาจารย์, ภาควิชาคหกรรมศาสตร์ คณะศึกษาศาสตร์ มหาวิทยาลัยรามคำแหง, E-mail: nathasar.p@rumail.ru.ac.th

[2] อาจารย์, ภาควิชาคหกรรมศาสตร์ คณะศึกษาศาสตร์ มหาวิทยาลัยรามคำแหง, E-mail: thosang.h@rumail.ru.ac.th

Knowledge Management of Community Economic Development Group: A Case Study of Mor-Hom Dyeing Group in Phrae Province*

***Nathasar Punbua*[1] *Thosang Hongkham*[2]**

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Abstract

This objectives of this research were to: 1) explore and develop knowledge management practice for Mor-Hom dyeing community economic development groups in Mueang Phrae District, Phrae Province; and 2) disseminate Mor-Hom dyeing knowledge and evaluate its practical application in communities interested in this traditional technique. The methodology included employing qualitative research methods and collecting data through in-depth interviews with local experts across five communities. The dissemination of Mor-Hom dyeing knowledge involved organizing community meetings, creating informational documents, and validating the content with three experts. A community meeting with 30 participants interested in Mor-Hom dyeing was held to further disseminate the knowledge and monitor its practical application.

The study identified three key stages in the knowledge management process for Mor-Hom dyeing: 1) preparation of wet Mor-Hom, including leaf preparation, alkaline water creation, and fermentation; 2) dyeing process, involving dye vat preparation and material treatment; and 3) application of Mor-Hom dye. Community follow-up revealed that 90% of participants effectively applied the knowledge acquired. The most comprehended topics were leaf preparation, followed by Mor-Hom fermentation and the creation of alkaline water. Key benefits of participation included understanding the Mor-Hom dyeing process, gaining practical skills, acquiring additional knowledge on Mor-Hom cultivation and harvesting, and the potential to disseminate this knowledge furt her. Moreover, the process inspired participants to produce Mor-Hom-dyed textiles for household.

Keywords: Knowledge Management, Community Economic Development Group, Mor-Hom Dyeing, Natural Dye

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[1] Lecturer, Department of Home Economics, Faculty of Education, Ramkhamhaeng University, E-mail: nathasar.p@rumail.ru.ac.th

[2] Lecturer, Department of Home Economics, Faculty of Education, Ramkhamhaeng University, E-mail: thosang.h@rumail.ru.ac.th

Introduction

The Mor-Hom fabric from Thung Hong Subdistrict, Mueang Phrae District, Phrae Province, represents a traditional craft with over 200 years of history. Mor-Hom dyeing is deeply integrated into the lifestyle of Phrae's communities. Historically, Mor-Hom was valued not only for its textile applications but also for its medicinal properties, such as enhancing blood circulation and aiding digestion. Over time, Mor-Hom-dyed fabric has become a cultural identity of Phrae Province, known for its versatility and suitability for various occasions. Today, efforts are being made to encourage the local population to wear products dyed with Mor-Hom more frequently (Sritraiy, n.d., pp. 3-4 as cited in Teeramongkol, 2021, p. 100).

Traditional Mor-Hom dyeing methods involved the manual production of natural dyes, which was labor-intensive and time-consuming. The advent of chemical dyes has offered greater convenience and efficiency, leading to a decline in the use of natural dyeing processes. Despite this, textiles dyed with natural Mor-Hom are valued for their breathability and heat resistance, as the reflective qualities of Mor-Hom dye help reduce heat when worn in hot climates. These and promote the traditional Mor-Hom dyeing process to ensure that this cultural wisdom is passed on to future generations (Keawsrithong, 2020, p. 72).

In alignment with the 2023–2027 National Research Strategic Plan, which emphasizes advancing research to foster a balanced and knowledgeable Thai society, this study aims to cultivate citizens equipped with advanced skills and competencies. The objective is to drive national transformation, enhance economic competitiveness, and support sustainable social development (National research council of Thailand, 2023). In support of these goals, and with a focus on fostering a morally grounded society that values its cultural heritage, this research addresses the need for systematic knowledge management of traditional Mor-Hom dyeing techniques. A review of existing documentation highlights that some communities have begun incorporating chemicals into their dyeing processes, which diminishes the value of Mor-Hom products, relegating them to low-cost goods. Despite the substantial income that Mor-Hom fabric can generate for local communities, the researchers recognized critical challenges that warrant attention. According to the 2024 OTOP (One Tambon One Product) event held in Phrae Province, organized by the Provincial Knowledge-Based OTOP (KBO) Committee, a total of 232 producers participated. Sales revenue reached 1,835,906,256 baht, reflecting a 4% increase compared to 2023. Among the best-selling product categories were textiles and garments, with Mor-Hom being the province's signature fabric (Provincial community deverlopment office of Phrae, 2025). These findings prompted the researchers to focus on addressing the challenges and advancing the development of Mor-Hom dyeing techniques. Recognizing this issue, this study examines the knowledge management practices of

community economic development groups focusing on Mor-Hom dyeing in Mueang Phrae District, Phrae Province. It aims to systematically collect and organize knowledge related to Mor-Hom dyeing, converting tacit knowledge into explicit knowledge. Additionally, the study seeks to develop and share an optimal Mor-Hom dyeing formula with interested community members, ensuring the sustainability of this traditional wisdom and its contribution to increasing the value of Mor-Hom products.

Research Objectives

1. To explore and develop knowledge management practices for Mor-Hom dyeing community economic development groups in Mueang Phrae District, Phrae Province.

2. To disseminate Mor-Hom dyeing knowledge and evaluate its practical application in communities interested in this traditional technique.

Knowledge and Knowledge Management

Knowledge is the integration of experience frameworks, values, contextual information, expertise, and intuition, which forms a basis for evaluation. (Davenport and Prusak, 1998 as cited in Kaewkamthong, 2017, pp. 12-13) define knowledge as the amalgamation of experience and information.

The development of knowledge originates from data. Data refers to raw facts about events that have not yet been processed or analyzed. When data is collected, categorized, analyzed, or processed to add value for users, it becomes information. Information, when combined with experience, judgment, skills, or values for problem-solving or task execution, develops into knowledge (Nonaka, et al., 2000, p. 11).

Knowledge can be categorized into two types:

1. Tacit Knowledge: Tacit knowledge is embedded within individuals, derived from actions, beliefs, skills, and experiences. It often stems from learning, training, or inherent talent, and it is challenging to express or document in written form.

2. Explicit Knowledge: Explicit knowledge is documented and tangible, including materials such as books, manuals, articles, journals, research papers, and reports. It is easily accessible, transferable, and learnable by others.

These two types of knowledge can be created and exchanged within organizations depending on the situation, potentially generating new knowledge. This is conceptualized in the SECI Model (Nonaka et al., 2000), which identifies four modes of knowledge conversion and creation: socialization, externalization, combination, and internalization, as shown in Figure 1.

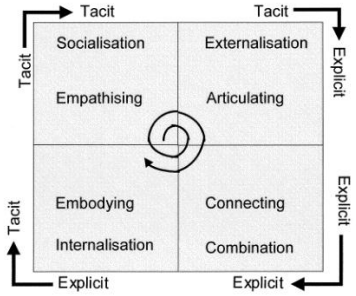

Figure 1: SECI Model, Source: Nonaka et al., (2000)

1. Socialization: Knowledge sharing through direct or mediated interactions, transferring tacit knowledge from one individual to another, such as through meetings, brainstorming sessions, and experience sharing.

2. Externalization: Transforming tacit knowledge into explicit knowledge by documenting it in written form, such as manuals, guidelines, or training materials, enabling broader dissemination.

3. Combination: Consolidating explicit knowledge to create new knowledge or expand the organization's knowledge base, as in planning or conducting scenario-based forecasting.

4. Internalization: Applying explicit knowledge in practice, allowing individuals to acquire skills and transform it into their tacit knowledge through experience.

Methodology

The knowledge management process for community economic development groups was conducted as a case study on the Mor-Hom dyeing group in Mueang Phrae District, Phrae Province. The study was divided into three phases as follows:

Phase 1: Knowledge Management of the Mor-Hom Dyeing Community Economic Development Group

To achieve Objective 1, qualitative research methods were employed, with data collected through in-depth interviews. A semi-structured interview method was employed, using an interview guide that had been validated for content accuracy through the Index of Item-Objective Congruence (IOC). The validation was conducted by three experts, with all question items scoring above 0.6. Interviews were conducted with local experts from five communities: Ban Na Tong dyeing group, Thung Charoen Natural Dyeing Group, Na Kuha Mor-Hom Community Enterprise, Traditional Mor-Hom Textile Community Enterprise, and Kaew Wanna Mor-Hom Dyeing Group, all of whom had over ten years of experience. These communities are part of the Community Economic Development Group in the province. Each community was interviewed three times:

1. First Interview: Identifying issues and auditing the community's existing knowledge (Knowledge Audit) to define the scope of knowledge management for Mor-Hom dyeing (Scope Meeting).

2. Second Interview: Systematizing, developing, and sharing expert knowledge using knowledge engineering methods to create structured knowledge (Knowledge Capture Meeting).

3. Third Interview: Converting tacit knowledge into explicit knowledge through a systematic knowledge management process. This phase included validating the knowledge obtained (Validation Meeting) and creating dissemination materials such as textual documents and infographics, which were reviewed for accuracy.

Phase 2: Dissemination of Mor-Hom Dyeing Knowledge

This phase addressed Objective 2 by organizing community meetings with the following steps:

1. Community Meetings: Target groups were identified, and invitations were sent to 30 participants from other interested communities and Mor-Hom dyeing had not yet been practiced within their own communities. These meetings provided demonstrations of the Mor-Hom dyeing process and disseminated information via documents prepared by the researchers.

2. Evaluation of Outcomes: Follow-up assessments were conducted to determine the extent to which participants applied the knowledge gained from the dissemination activities.

Research Procedure

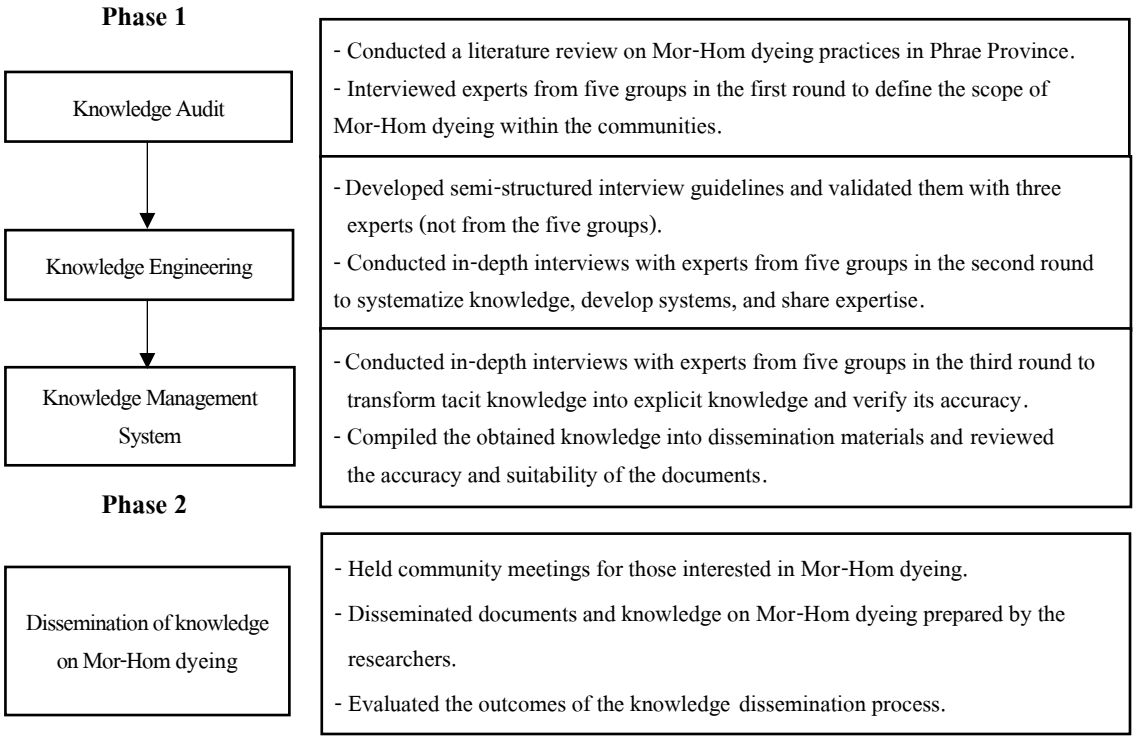

Figure 2: Research Procedure

Analysis Results

Phase 1: Addressing Objective 1 - Data Collection through Informal Interviews

To achieve Objective 1, data was collected through informal interviews with five community groups: Ban Na Tong Dyeing Group, Thung Charoen Natural Dyeing Group, Na Kuha Mor-Hom Community Enterprise, Traditional Mor-Hom Textile Community Enterprise, and Kaew Wanna Mor-Hom Dyeing Group. Each community was interviewed three times.

In the first interview, key issues were identified, and the foundational knowledge of the communities was assessed through a Knowledge Audit to define the scope of knowledge management for Mor-Hom dyeing (Scope Meeting). Based on a literature review of Mor-Hom dyeing, the process was divided into three stages as follows:

1. Preparation of Wet Mor-Hom:

- Preparation of Mor-Hom leaves.
- Creation of alkaline water using lime.
- Fermentation of Mor-Hom.

2. Dyeing Process:

- Preparation of the dye vat.
- Preparation of materials before dying.

3. Dyeing with Mor-Hom.

The result of first round of interviews with community economic development groups. It was found that five communities with the Mor-Hom dyeing process were divided into three stages, as outlined in the literature review. However, the Thung Charoen Natural Dyeing Group, new vats are not created regularly, as many were prepared long ago. Instead, acidic and alkaline nutrients from fruits are added to maintain the dye vat for continued use.

In the second round, semi-structured interview guidelines were developed and three experts validated the knowledge. These guidelines were then used for in-depth interviews to systematize, develop, and share expert knowledge using Knowledge Engineering methods. This process aimed to create structured knowledge (Knowledge Capture Meeting) on the the processes of Mor-Hom dyeing are as follows:

Ban Na Tong Dyeing Group (Ms. Benyaporn Sipnoi)

Preparation of Mor-Hom Leaves: Mor-Hom leaves are harvested in the morning, washed thoroughly three times or until clean, drained using a sieve, and prepared for fermentation.

Preparation of Alkaline Water from Lime: Lime is purchased from the Na Kuha network group. The ratio is 2 kg of lime per 10 liters of water. After settling, the clear solution is stored for use.

Fermentation of Mor-Hom: Mor-Hom leaves (30 kg) are fermented in a 100–200-liters plastic container with 15 liters of water. The leaves are submerged with a weighted object, sealed for 1 night, and stirred the next day. The resulting clear liquid is mixed with 6 liters of alkaline water per 80 liters of Mor-Hom solution. The mixture is stirred using a modified drill for 3–5 minutes and drained in cloth bags to obtain the wet Mor-Hom.

Dye Vat Preparation: Wet Mor-Hom (3 kg) is mixed with filtered alkaline water in a plastic container. The pH level is measured using litmus paper (pH 11–14). A mixer is used to stir until a thin blue-purple film forms on the dye liquid. If the film does not form, nutrients such as bananas, sugarcane, and pineapples are added.

Cleaning of Materials: Dirt and starch are removed from the materials by boiling them in ash-based alkaline water for 15-30 minutes in boiling water. Afterward, the materials are rinsed, wrung out, and shaken before drying.

Dyeing Process: Damp fabrics are immersed in the dye vat and kneaded repeatedly to achieve the desired shade. Excess dye liquid is wrung out, and the materials are left exposed to air to develop the characteristic blue color. If a deeper color is desired, the process is repeated.

Thung Charoen Natural Dyeing Group (Ms. Praphapan Sritraiy)

Preparation of Mor-Hom Leaves: Whole plants, including mature leaves, stems, and branches, are harvested in the morning when the plants are 8 months old.

Preparation of Alkaline Water from Lime: 2 scoops of lime are dissolved in water and mixed into the fermentation water, or red lime may be used as an alternative.

Fermentation of Mor-Hom: Mor-Hom leaves (7 kg) are soaked in 15–20 liters of water in a container, pressed down with stones, and left for 24–48 hours. The leaves are stirred periodically until the dye is released. After fermentation, the solution is mixed with alkaline water and stirred using a machine for 5 minutes to obtain the wet Mor-Hom.

Dye Vat Preparation: Lime or red lime mixed with Mor-Hom is stirred for 30 minutes to introduce air. Blue specks in the foam indicate readiness. A mixing machine may also be used for 5–10 minutes. Afterward, the liquid is poured into a storage vat and left to settle for 3–4 days until the sediment forms.

Cleaning of Materials: Cleaning of Materials: Materials are cleaned by boiling them in alkaline ash water or detergent at 90-100°C for 15–30 minutes.

Dyeing Process: Damp materials are immersed in the dye vat and kneaded repeatedly until the desired shade is achieved.

Na Kuha Mor-Hom Community Enterprise (Mr. Sawang Siture)

Preparation of Mor-Hom Leaves: Leaves are harvested when they are 7–8 months old and dark green in color. The top 20–50 cm of the plants is cut, avoiding excessive pruning to allow regrowth.

Preparation of Alkaline Water from Lime: Lime is purchased from Mae Lao District, Chiang Rai, in bulk (1.5–2 tons per order). The ratio is 2 kg of lime per 10 liters of water. The clear solution is stored for use. Fermentation of Mor-Hom: Fermentation of Mor-Hom: Mor-Hom leaves (30 kg) are fermented in 200-liter plastic containers filled with water. Leaves are submerged with stones and sealed for 1–3 nights depending on the season. Fermentation is shorter in summer (24–48 hours) and longer in winter (72 hours). Excessive fermentation leads to spoilage. The fermented liquid is mixed with alkaline water and stirred for 2 minutes using a mechanical device to obtain wet Mor-Hom.

Dye Vat Preparation: Wet Mor-Hom is combined with lime-based alkaline water in a plastic container. The pH is measured (11–14) using litmus paper. A motorized mixer is used to create foam and ensure uniform distribution until a blue film appears on the surface.

Cleaning of Materials: Dirt and starch are removed by boiling or soaking in alkaline ash water or washing in clean water for 15–30 minutes. The materials are wrung out and dried. For yarn, a snapping technique is used before drying to prevent tangling.

Dyeing Process: Damp materials are submerged in the dye vat, which appears greenish-yellow. Kneading or agitation is performed to allow even absorption. Once the desired shade is achieved, the materials are wrung out and air-exposed to fix the blue color. This process may be repeated to intensify the shade.

Traditional Mor-Hom Textile Community Enterprise (Mr. Kittiphong Khaikam)

Preparation of Mor-Hom Leaves: Mor-Hom leaves are sourced from neighboring groups (Ban Mae Lua, Na Kuha, and Na Tong). The leaves are cleaned and drained before fermentation.

Preparation of Alkaline Water from Lime: Lime is purchased from a network group in Phrae Province. The ratio is 2 kg of lime per 10 liters of water. After settling, the clear solution is stored for use.

Fermentation of Mor-Hom: Leaves (10 kg) are fermented in plastic or earthenware containers with 5 liters of water. Stones are used to submerge the leaves, and they are stirred daily. Fermentation lasts 24–72 hours depending on the season. After fermentation, the solution is mixed with 3 liters of alkaline water per 40 liters of Mor-Hom liquid, stirred for 2–5 minutes using a hand mixer, and drained to obtain wet Mor-Hom.

Dye Vat Preparation: Wet Mor-Hom is mixed with ash-based alkaline water in a vat. The acidity or alkalinity is gauged through taste. The mixture is stirred twice daily (morning and evening) to create a

thin surface film. Acidic and sweet fruits such as starfruit, kaffir lime, tamarind, sugarcane, and pineapple are added to maintain the vat.

Cleaning of Materials: Dirt is removed by boiling the materials in ash-based alkaline water for 15–30 minutes or soaking in wet Mor-Hom alkaline water.

Dyeing Process: Dry materials are soaked until damp and immersed in the dye vat. Agitation ensures uniform dyeing. Materials are removed, wrung out, and left to dry. Dye vats are segregated for in-house products and outsourced products to prevent contamination, as outsourced materials may introduce chemicals that could damage the vat.

Kaew Wanna Mor-Hom Dyeing Group (Ms. Payom Kumwang)

Preparation of Mor-Hom Leaves: Fresh leaves, stems, and branches are harvested 8–10 months after planting. Leaves are picked from the top 20–30 cm of the plant in the morning.

Preparation of Alkaline Water from Lime: Alkaline water is made from ashes of banana stems, eucalyptus bark, or coconut shells burned at home. The ratio is 1 kg of ash per 3 liters of water. After settling for 1 night, the clear liquid is filtered and used.

Fermentation of Mor-Hom: Mor-Hom leaves (30 kg) are fermented in 200 liters of water in a sealed container. Stones are used to submerge the leaves, which are stirred daily. Fermentation takes 48–72 hours depending on temperature. The resulting liquid is mixed with lime and stirred for 2–3 minutes to produce wet Mor-Hom. The mixture is drained through cloth bags to remove excess moisture.

Dye Vat Preparation: Wet Mor-Hom (3 kg) is combined with ash-based alkaline water (10 liters), lime (1 kg), and nutrient sources such as sugarcane, ripe bananas, and pineapple. The mixture is stirred daily with a scoop (4–5 times) to allow aeration. A foam layer indicates readiness. This process takes 3–4 weeks.

Cleaning of Materials: Materials are cleaned in alkaline ash water with a concentration of 5 g/liter. Yarn is looped to prevent tangling, and fabrics are agitated during soaking at 90–100°C for 30 minutes to 1 hour. After boiling, they are rinsed until clean and dried.

Dyeing Process: Damp materials are immersed in the dye vat and kneaded repeatedly. After achieving the desired shade, excess dye is removed by boiling with fermented water for 5–10 minutes at 90–100°C. The materials are rinsed repeatedly until clear water is achieved.

Based on in-depth interviews conducted with all five communities, the knowledge gathered on Mor-Hom dyeing was compiled to create a Knowledge Management Manual for Mor-Hom Dyeing, as illustrated in Figure 3.

Figure 3: Knowledge Management Manual for Mor-Hom Dyeing

In the third round, tacit knowledge was transformed into explicit knowledge through a systematic knowledge management process. The Knowledge Management Manual for Mor-Hom Dyeing was presented to all five communities for validation. The validation meeting confirmed that the knowledge in the manual was accurate, appropriate, and could be used to disseminate Mor-Hom dyeing knowledge to individuals or other communities with an interest in Mor-Hom dyeing.

Phase 2: Dissemination of Mor-Hom Dyeing Knowledge to Interested Communities

To achieve Objective 2, A community meeting was held at Ban Ton Nun Village, Moo 7, Ban Wiang Subdistrict, Rong Kwang District, Phrae Province, with 30 participants attending. The purpose of the meeting was to distribute the manual and share knowledge on Mor-Hom dyeing. A follow-up survey was used to assess the utilization of the knowledge presented in the manual. The survey consisted of two parts:

1. General information.

2. Benefits gained from studying the Mor-Hom dyeing process using the manual.

Participants then completed the follow-up survey to evaluate the practical application of Mor-Hom dyeing knowledge.

The study found that 30 participants attended the meeting, consisting of 12 males (40%) and 18 females (60%). Among the respondents to the follow-up survey, 90% successfully applied the knowledge gained, while 10% could not apply it. The topics in which respondents reported increased knowledge and understanding after studying the manual, ranked from most to least, were the process of preparing Mor-Hom leaves, fermentation of Mor-Hom, preparation of alkaline water using lime, preparation of the dye vat, preparation of materials before dying, and the process of dyeing with Mor-Hom. The benefits gained from attending the meeting included learning the Mor-Hom dyeing process, being able to implement it in practice, gaining additional knowledge about Mor-Hom cultivation and harvesting, the ability to disseminate the knowledge further, and being inspired to produce Mor-Hom-dyed fabrics for household use.

Research Summary

Knowledge management was conducted in two phases:

Phase 1 Knowledge Management for Mor-Hom Dyeing: This phase utilized qualitative research methods to systematize and manage knowledge related to Mor-Hom dyeing. Data was collected through in-depth interviews with community experts who had over 10 years of experience. The five participating communities were Ban Na Tong Dyeing Group, Thung Charoen Natural Dyeing Group, Na Kuha Mor-Hom Community Enterprise, Traditional Mor-Hom Textile Community Enterprise, and Kaew Wanna Mor-Hom Dyeing Group. Each community was interviewed three times:

1. First Interview: Focused on identifying issues and auditing the community's knowledge to define the scope of knowledge management for Mor-Hom dyeing.

2. Second Interview: Aimed at systematizing the knowledge gained, developing frameworks, and sharing expert knowledge using knowledge engineering methods.

3. Third Interview: Involved transforming tacit knowledge into explicit knowledge, validating the knowledge, and creating dissemination materials, such as text-based manuals and infographics.

In this phase, tacit knowledge was transformed into explicit knowledge through a systematic knowledge management process. The Knowledge Management Manual for Mor-Hom Dyeing was presented to all five communities for validation. The validation meeting confirmed that the knowledge in the manual was accurate, appropriate, and could be used to disseminate Mor-Hom dyeing knowledge to individuals or other communities with an interest in Mor-Hom dyeing.

The foundational knowledge of the five communities was assessed through a Knowledge. Audit to define the scope of knowledge management for Mor-Hom dyeing, the study identified three main stages in the Mor-Hom dyeing process:

1. Preparation of wet Mor-Hom:

Preparation of Mor-Hom Leaves: Leaves are harvested in the morning when they are approximately 7–8 months old. The top 20–40 cm of the plant is cut, starting from the tip. In the Thung Charoen Natural Dyeing Group and the Kaew Wanna Mor-Hom Dyeing Group, branches and stems are also collected. The Traditional Mor-Hom Textile Community Enterprise does not cultivate its own Mor-Hom but maintains a demonstration plot for educational purposes. Leaves are sourced from network groups in Ban Mae Lua, Na Kuha, and Na Tong. After harvesting, the leaves are thoroughly washed, drained using a sieve, and prepared for fermentation.

Preparation of Alkaline Water from Lime: Communities typically purchase lime from their local networks. The standard ratio is 2 kilograms of lime to 10 liters of water. The lime is soaked until sediment settles, and the clear solution is stored for later use. An exception is the Kaew Wanna Mor-Hom Dyeing Group, which produces its own alkaline water by burning agricultural residues, such as banana stems and coconut shells. Additionally, the Thung Charoen Natural Dyeing Group occasionally substitutes red lime for standard lime.

Fermentation of Mor-Hom: All five communities follow similar fermentation practices. Approximately 30 kilograms of Mor-Hom leaves are placed in a 100–200-liter plastic container filled with 15 liters of water. The leaves are submerged using a weighted object, and the container is sealed. In winter, the leaves are fermented for approximately 72 hours, while in summer, fermentation lasts 24–48 hours. The leaves are stirred to ensure even fermentation, and the process is monitored for visual indicators such as softened leaves and yellow-green liquid with blue foam. Once fermentation is complete, the liquid is mixed with alkaline water (6 liters of alkaline water per 80 liters of Mor-Hom solution). The mixture is stirred using a machine for 3–5 minutes and drained in cloth bags to obtain wet Mor-Hom, which is then ready for the next dyeing process.

2. Dyeing process:

Dye Vat Preparation: Wet Mor-Hom (3 kg) is combined with 1 kg of lime in a plastic container and mixed with alkaline water. The pH is measured using litmus paper (pH 11–14) by the Ban Na Tong Dyeing Group and the Na Kuha Mor-Hom Community Enterprise. In contrast, the Traditional Mor-Hom Textile Community Enterprise gauges acidity and alkalinity by taste for astringency. The mixture is stirred or aerated 3–4 times daily until a thin blue-purple film forms on the dye surface. If the foam dissipates, indicating improper balance, a small amount of lime is added. Once the water and sediment turn yellow, the dye liquid is ready for use. The Traditional Mor-Hom Textile Community Enterprise and Kaew Wanna Mor-Hom Dyeing Group enrich the vat with acidic fruits such as bananas, sugarcane, pineapples, starfruit, kaffir lime, and tamarind.

Preparation of Materials Before Dyeing: Dirt is removed by boiling materials in alkaline ash water at a concentration of 5 g/liter. For yarn, looping prevents tangling, while fabric is immersed and agitated during the cleaning process. The cleaning is conducted at 90–100°C for 30 minutes to 1 hour. After boiling, materials are rinsed thoroughly and dried to ensure no residue remains, leaving them ready for dyeing.

3. Dyeing with Mor-Hom:

Dyeing Process: The materials are soaked and dampened before dyeing. The dye liquid appears yellow, and the materials are immersed, kneaded repeatedly, and agitated to allow uniform absorption. Once the desired color is achieved, the materials are wrung out and exposed to air, turning the fabric blue through oxidation. This process can be repeated for deeper color intensity. Materials are rinsed multiple times until the water runs clear.

The Traditional Mor-Hom Textile Community Enterprise uses separate vats for group products and outsourced dyeing to avoid chemical contamination, which could degrade the dye vat. Conversely, the Kaew Wanna Mor-Hom Dyeing Group removes excess dye by boiling the materials in fermented water for 5–10 minutes at 90–100°C. The materials are then rinsed multiple times to ensure color fastness and remove any remaining pigment.

The success of Mor-Hom dyeing in the five communities can be attributed to several key factors. These include ongoing support from both government and private sectors in facilitating experimentation and research for the development of dyeing techniques; active knowledge exchange activities among communities, community enterprise networks, educational institutions, and local agencies; and strong media interest and support across multiple channels, which have helped promote the communities and disseminate information about Mor-Hom dyeing through both offline and online platforms. Additionally, the presence of Mor-Hom product networks has played a crucial role in furthering the distribution and commercialization of Mor-Hom textiles.

Phase 2 Dissemination of Mor-Hom Dyeing Knowledge: To disseminate the knowledge, a community meeting was held at Ban Ton Nun Village, Moo 7, Ban Wiang Subdistrict, Rong Kwang District, Phrae Province. A total of 30 participants (12 males and 18 females) attended the meeting. The Knowledge Management Manual for Mor-Hom Dyeing was distributed, and the participants were taught the dyeing process.

A follow-up survey revealed that 90% of participants successfully applied the knowledge. Participants in the community meeting demonstrated a strong interest in Mor-Hom dyeing, as their daily lives were closely connected to communities engaged in cultivating and dyeing Mor-Hom. After studying the Mor-Hom dyeing manual, many found it practical and applicable, enabling them to produce Mor-Hom textiles for household use. Benefits reported by participants include community members acquired new competencies and integrated them into their professional practices. However, 10% of participants reported being unable to utilize the manual effectively, citing that it was too concise and lacked sufficient detail to fully support implementation.

Discussion

1. The study's knowledge management methodology adhered to established frameworks, aligning with the models proposed by Emberey et al., 2007, p. 9. It applied the principles of the Knowledge Audit phase involved a literature review and the first round of interviews with subject-matter experts. The Knowledge Engineering phase entailed the development of a semi-structured interview guide, which was validated by experts not involved in the initial Knowledge Audit interviews. This was followed by a second round of in-depth interviews with experts to systematically organize, develop, and share expert knowledge in a structured format (Knowledge Capture Meeting) and the Knowledge Management System phase consisted of a third round of in-depth interviews with experts from five community groups. This phase aimed to convert tacit knowledge into explicit knowledge, validate the accuracy of the information, and compile the findings into dissemination materials, which were then reviewed for accuracy and relevance.

The study applied the Knowledge Spiral (SECI Model), which outlines four modes of knowledge creation (National science and technology development Agency, 2014)

1) Socialization: Tacit knowledge was gathered through interviews and direct exchanges with experts from five different communities. This process facilitated the transfer of experiential knowledge rooted in local traditions and cultural practices.

2) Externalization: The tacit knowledge obtained was systematically transformed into explicit knowledge in the form of a Mor-Hom dyeing manual. This step allowed the internal experiences and skills of the experts to be clearly documented and shared.

3) Combination: The explicit knowledge from each expert was synthesized and integrated into a new body of knowledge. This content was customized to align with the dyeing practices and cultural context of communities in Phrae Province, ensuring relevance and applicability.

4) Internalization: The finalized manual was disseminated to other communities that had not previously engaged in indigo dyeing. Through practical training and workshops, community members internalized the knowledge, turning it into hands-on skills that could be sustainably applied and further transmitted.

These findings indicate that the SECI model effectively supports the preservation and revitalization of indigenous knowledge. It provides a structured approach to knowledge creation, sharing, and application, contributing to cultural sustainability and community empowerment.

2. The application of Mor-Hom dyeing knowledge by participants showed that the shared knowledge was highly practical. Sources of knowledge related to Mor-Hom dyeing were identified as:

1) Traditional knowledge.

2) New knowledge derived from local adaptations and supported by government and private sector development initiatives.

These findings align with prior research by Wattanachanobol, Sakda, and Pengthowong, 2015, p.15, Wongbunmak, 2015, p.96, Dechkulthong, 2017, pp. 13-14 and Kunpluem, 2017, p. 285 which emphasized two key methods of knowledge transfer: demonstration and hands-on practice, suitable for learners of all ages, including children and adults.

3) The study identified three main stages in the Mor-Hom dyeing process:

(1) Preparation of wet Mor-Hom: This includes harvesting Mor-Hom leaves, creating alkaline water from lime, and fermenting the leaves.

(2) Dyeing process: Involves preparing the dye vat by mixing wet Mor-Hom with lime and alkaline water. The pH is tested with litmus paper (pH 11–14) or by taste for astringency. Some communities add acidic fruits, such as bananas and tamarind, as nutrients for the dye vat.

(3) Dyeing with Mor-Hom: Materials are cleaned, immersed in the dye vat, kneaded, and exposed to air to achieve the desired color. Specific variations include boiling dyed materials in fermented water to prevent color bleeding, as practiced by the Kaew Wanna Mor-Hom Dyeing Group.

The dyeing process aligns with finding by Intawiwat, 2012, pp. 30-34 and Treetrong, 2018, pp. 18-22.

4) Knowledge Management of Mor-Hom Dyeing Group align with finding by Siriworasakul and Inapromae, 2016, p.45 who noted that the benefits of knowledge management will help organizations, communities and society to use the managed knowledge to increase productivity in community development, product and service development.

Recommendations

General Recommendations

1. Government agencies should support communities in adopting clear models for cultivating Mor-Hom in environments conducive to its growth. Expanding cultivation to areas with similar environmental conditions to those in this study is recommended.

2. A systematic plan for Mor-Hom production, covering all stages from upstream to downstream, should be developed. This plan should align with national and local development strategies while ensuring community participation in every step to promote sustainable development.

Recommendation for Future Research

1. Knowledge dissemination should employ diverse and accessible formats tailored to participants, such as demonstrations and media that clearly depict each step of the process. This approach is especially important for participants with limited literacy skills.

2. For the future development of knowledge management manuals, it is recommended to create electronic versions and utilize online platforms, such as AI-based knowledge management systems or e-learning tools, to improve accessibility and deliver more comprehensive content. The design and content should be tailored to align with the specific context and needs of each community.

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