Guidelines for Knowledge Management on Supply Chains of Mao's Route

Pramote Laolapha[1] Kannika Sombun[2] Weerayut Srihanoo[3] and Indhus Sributta[4]

Abstract

This qualitative research has objectives to study the knowledge management process and the guidelines for knowledge management on supply chains of Mao's route. The key informants were three Mao farmers and three Mao processing entrepreneurs. Data were collected by using focus group interview and non-participant observation. Data were analyzed by using content analysis. The research results reveal that the knowledge management on supply chains of Mao's route consists of 4 chains namely Mao planting, Mao processing, Mao marketing, and Mao's academic sector. These chains are driven by the knowledge management process for developing the route of Mao, which involves the knowledge identification, knowledge acquisition and creation, knowledge storage, Knowledge evaluation, Knowledge usage, and knowledge sharing. The discovered solutions for knowledge management on supply chains of Mao's route include increasing the Mao growing area, zoning Mao plantations that match the variety of Mao, organizing the data recording, developing Mao orchards to become sources for learning and conserving Mao breeds, developing new products, maintaining quality of Mao products, establishing a coaching system, improving the marketing strategies, employing the barcode technology on the packages, promoting online sales, considering benefits of consumers, and operating with a Mao-loving mind.

Keywords: Knowledge Management, Mao, Supply Chain

[1] Assistant Professor, Faculty of Natural Resources, Rajamangala University of Technology Isan, Sakon Nakhon Campus, Corresponding author E-mail: mote_p@hotmail.com

[2] Assistant Professor, Faculty of Natural Resources, Rajamangala University of Technology Isan, Sakon Nakhon Campus

[3] Lecturer, Faculty of Natural Resources, Rajamangala University of Technology Isan, Sakon Nakhon Campus

[4] Lecturer, Faculty of Natural Resources, Rajamangala University of Technology Isan, Sakon Nakhon Campus

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Introduction

Important changes at the global level affecting both opportunities and risks about development of Thailand concern with regulations for administering the world economy in terms of trades, investment, finance, environment, and society, including regulations on intellectual property protection. These rules will be a tool of commercial negotiation that forces Thai entrepreneurs to lift their production level to meet the specified standards in order to cope with the competition. However, the economic structure of Thailand is still unable to support sustainable growth due to its reliance on foreign economy regarding exportation and investment. Thai economy is therefore sensitive to fluctuation of the world economy and the surrounding global factors that are changing. Meanwhile, the country's economic inequality persists as it is apparent that people in the grass root level, most of who are in the agricultural sector, have less income as compared to those outside this sector. Therefore, Thailand has to reform its economic structure toward quality and sustainable development. Strategies must be invented and implemented to strengthen its entrepreneurs, especially those at the medium size and small size levels, to be able to play a role in improving the domestic economy and to succeed in competitions. The agricultural sector should be developed with solutions to enhance productivity and create additional value to the products by employing scientific knowledge, technology, and creative thinking (Office of the National Economic and Social Development Board, 2011).

Mao (*Antidesma thawaitesianum* Muell. Arg.) is a fruit tree localized in the upper Northeastern region of Thailand, particularly along Phu Phan Mountain. Agricultural Research and Training Institute of Sakon Nakhon province (Faculty of Natural Resources Rajamangala University of Technology Isan Sakon Nakhon Campus at present) has conducted research on Mao since 1994. The research has led to origination of various products from Mao including Mao wine, concentrated Mao drink, ready-to-drink Mao juice, Genuine Mao drink, Mao jam, stirred Mao preserve, etc. Moreover, the Institute has transferred knowledge from the research to farmers and communities continuously; making Mao more widely known and Mao orchards keep increasing in Sakon Nakhon province. Since Mao fruits can be processed into a wide variety of products, this local fruit tree is considered to have high potential to be developed for both economic and environmental purposes (Pranakhon et al., 2006). In the economy aspect, Mao is a good source of income for farmers who can sell fresh Mao fruits, Mao seedlings, Mao juice, and Mao wine. The yearly value acquired from Mao trades keep increasing continuously, from 17,600,000 baht in 2009 to 26,710,000 baht in 2010, 37,215,000 baht in 2011, 53,480,000 baht in 2012, and 85,680,000 baht in 2013. Nevertheless, Mao production still encounters problems at all upstream, midstream, and downstream levels due to the lack of knowledge and processing materials that results in non-standard products (Naksawas, 2013). For tangible

development of Mao products, a driving force from cooperation of all sectors is required. All stakeholders have to creatively learn together in terms of production factors, establishment of production standards, etc. The learning must comply with the knowledge management so that the business can grow continuously and sustainably (Somboon, 2006).

According to the aforementioned importance and problems, the research team is interested to conduct a research on “Guidelines for Knowledge Management on Supply Chains of Mao’s route,” which should provide some guidelines for developing Mao business to be strong and sustainable.

Objectives

1. To study the process of knowledge management on supply chains of Mao’s route
2. To create the guidelines for knowledge management on supply chains of Mao’s route

Methodology

This research was conducted as a descriptive research by using qualitative research methodology with these following details.

1. Research instruments

The research instruments are interview guides. These issues were created from studying relevant principles, concepts, theories, and researches. Subsequently, main issues and sub issues were identified so that the complete details of the interested matter are covered. Interview guides consist of five components are knowledge management process, Mao planting, Mao processing, Mao marketing and the guidelines for knowledge management on supply chains of Mao’s route.

2. Data collection

The data were collected by means of focus group interview and non-participation observation.

3. Key informants

Key informants were Mao farmers including Mr.Pit Sanboonmee, Mr.Thawatchai Kunnawong, Mr.**Kreangkrai** Naksawas (President of Mak Mao Sakon Nakhon Club) and Mao processing entrepreneurs including Wannawong Fruit Wine, Inpang Center and Sakon Nakhon Winery.

4. Data analysis

The data analysis was conducted with data from the focus group interview and the non-participation observation by using a content analysis method. Inferences were created from the data analysis that involves data interpretation and data classification based primarily on main contents and matters in the study (Chantavanich, 2010).

Results

The study on knowledge management process and guidelines for knowledge management on supply chains of Mao's route yielded these following results.

1. The process of knowledge management on supply chains of Mao's route

1.1 Regarding knowledge identification can be conducted by the farmers or the Mao processing entrepreneurs. They will need to analyze their own requirements about the knowledge that they want to acquire. After that, sources of the knowledge will be specified. For example, in order to acquire knowledge about Mao growing, some farmers went to visit Mao orchards of other farmers before deciding to grow Mao. Some other farmers who wanted to know about how to acquire a certified symbol of Geographical Indication (GI) attended a conference that provided information about acquisition of a certified GIS symbol.

1.2 Regarding knowledge acquisition and creation is a procedure that requires the farmers to acquire knowledge by attending training courses and visiting orchards of other farmers. For example, a farmer said, "Before I decided to plant Mao, I have visited some Mao orchards of other farmers". In addition, knowledge created from experience, observations, assessments, and learning about farming can be applied to Mao planting. A farmer explained, for example, "Since there is no data available about Mao varieties, to choose a variety of Mao for planting, farmers have to conduct a visual assessment on characteristics of the trees and the fruits, such as having big fruits, long fruit stalks, sticky bouquets, sweet taste, etc." Furthermore, knowledge about Mao planting can be created with a trial-and-error method, as witnessed from an expression of a farmer, "Mao can be planted like other regular trees such as mango, longan, etc, and requires similar care. However, since no good model is available yet, we have to plant Mao by trial and error."

1.3 Regarding knowledge storage, knowledge about Mao can be stored by means of: 1) Memorization, which refers to storing knowledge within a person. Knowledge that can be memorized include knowledge about characteristics of each variety of Mao, how to plant and take care of Mao, how to get rid of weeds and pests of Mao, etc. 2) Taking notes is a method to note down data into a form, which may use, for example, to apply for a certified symbol of Geographic Indication (GI). Notes taken by a processing factory regarding Mao purchase can allow them to check reversely about the selling farmer, the purchasing quantity, and the date of purchase, etc.

1.4 Regarding knowledge evaluation, farmers can assess the knowledge prior to, during, and after utilizing the knowledge. When farmers have realized that the knowledge was ineffective, they may change to try another method. For example, a farmer said, "Initially I tried to get rid of beetles by spraying a chemical pesticide. But the bugs disappeared for just a week, and then returned. So now I try to have workers take care of the pest problem. They do this by checking nooks around Mao bases, and destroying any beetle eggs that they find."

1.5 Regarding knowledge usage, it was found that the knowledge was used in two forms. 1) Farmers may use knowledge developed by one self, such as knowledge about how to eliminate pests of Mao. It was found that the farmers used three methods for getting rid of red-headed beetles and flat-headed beetles that dwell around Mao stems. The first method is to mix tobacco with water and spray the liquid with a syringe into beetle holes. The second method is to use a syringe to spray pickled-fish water into beetle holes, and cover the holes with tree bark. The third method is to stick a rattan spine at the mouth of a hole. When a beetle climbs backward up the hole, it will be prickled by the spine that can lead to death. 2) Farmers may use knowledge developed by scholars such as knowledge about production of genuine Mao juice, ready-to-drink Mao juice, concentrated Mao drink, Mao wine, and so on.

1.6 Regarding knowledge sharing, two forms of exchanging were discovered: 1) informal knowledge exchange, such as discussions among farmers or between farmers and scholars during an observation tour in a Mao orchard; and 2) formal knowledge exchange, such as discussions during training organized by various organizations and meetings of Mak Mao Sakon Nakhon Club, etc.

2. Guidelines for knowledge management on supply chains of Mao's route

Management of Mao in Sakon Nakhon province is under supervision of Mak Mao Sakon Nakhon Club. Mao is the only plant that is managed by a club like this. The club focuses on downstream management in order to upgrade Mao to be quality goods that receives a certified GI symbol. Currently, three factories in Sakon Nakhon province have been granted permission to use a GI symbol, namely Wannawong Fruit Wine, Phu Phan Mao Juice Factory, and Phu Phan Drinks Factory. Receiving the GI symbol is effective in lifting the level of Mao products to become premium products that are ready for international markets. The GI symbol also increases the price of Mao, leading to higher income of farmers, buyers, and processing factories. Therefore, the attempt to push Mao products to receive GI symbol is an approach to guarantee quality of Mo products and allow them to be sold at a higher price. For success of this operation in both terms of quantity and quality, four "Mao chains" need to be developed. These chains are connected together and have joints that allow each stakeholder to share benefits fairly. Each chain needs to be viewed from the same angle and toward the same goal. Approaches for developing these chains are as follows.

2.1 Chain No. 1: Mao planting

Knowledge management in the first chain, Mao planting, is upstream knowledge management. The objective is to produce sufficient quantity of Mao for processing with these following solutions.

2.1.1 Increasing Mao planting area. Production of fresh Mao fruits is currently insufficient for being processed into products. This problem contradicts with the high market demand

on Mao. Therefore, planting area of Mao has to be increased. In addition, zoning should be applied in order to grow a proper variety of Mao in each zone.

2.1.2 Risk reduction. In a case that the market has insufficient fresh Mao for processing, a Mao processing factory needs to have its own Mao orchard, and should have some farmer members to supply Mao fruits to the factory.

2.1.3 Data recording system. Mao farmers usually have a disadvantage regarding data recording. To develop Mao business, data need to be recorded in detail and as completely as possible. A good data recording system is helpful for reverse checking, yield analysis, and market demand analysis, etc.

2.1.4 Mao varieties conservation. Utilization of Mao must go together with measures to conserve Mao varieties. Habitats of different varieties of Mao should be developed into Mao learning sources, conservation sources, or community biodiversity banks.

2.2 Chain No. 2: Mao processing

Knowledge management in the second chain, Mao processing, is midstream knowledge management. The objective is to process or develop various Mao products efficiently, which can be achieved with these following approaches.

2.2.1 Development of innovative Mao products. These products may include sugar-free Mao juice (Mao zero). For example, 100% Mao juice is considered as Mao zero because it contains neither sugar nor water. A quantity of 500 cc of 100% Mao juice can be sold at a price as high as 100 baht. If this product receives a GI certificate, its price may be increased to as high as 500 baht a bottle. Without developing new products, Mao market may be stagnant or stop expanding. Additional products from Mao may include Mao soap, Mao facial cream, Mao jelly, Mao capsules, etc. These products require supportive research.

2.2.2 The Thailand 4.0 campaign has a focus on creative economy, which relies on developing local wisdom into quality products with an outstanding story for selling. For example, with pH lower than 4.5, Mao is a lot more difficult to be fermented than other fruits. Another story is that, as grown near Phu Phek Pagoda that is located on the longitude perpendicular to Phu Phan Mountains, Mao here receives daylight for longer time, resulting in higher nutrients. Another interesting story is that genuine Mao drinks will cause the tongue to become black. That means, if the tongue does not turn black after drinking, that drink is fake Mao.

2.2.3 Quality of Mao products. Mao products can be maintained by means of internal audit and by pushing Mao factories to receive a GI symbol. Mak Mao Sakon Nakhon Club has an objective to make 8 factories receive GI certificates (including the 3 factories that have already obtained GI symbol). An internal audit manual may be used as a guideline for this operation.

2.2.4 Coaching system. In order to develop other groups of Mao processing entrepreneurs, a coaching system is required. For example, to obtain GI certificates for new groups, a group that has received a GI symbol must act as a coach for other groups.

2.3 Chain No. 3: Mao marketing

Knowledge management in the third chain, Mao marketing, is downstream knowledge management that can be done with these approaches.

2.3.1 Marketing strategies. In order to succeed in the market of digital economy era, a great variety of marketing strategies have to be developed. Examples of such strategies include creating networks, online selling, improving packages for attractiveness, and expanding the Mao market to overseas, which requires English labeling on the packages. In addition, Mao market may be divided into 3 levels namely a premium market, where the sale quantity is low but the price is high, a niche market, with special products for specific groups of customers, and a mass market for selling products to consumers in general at a low price. Therefore, choosing an appropriate market for each Mao product is important. For example, 100% Mao juice is suitable to be sold to only a premium market and a niche market.

2.3.2 Utilization of information technology (IT). IT may be used for printing barcodes on labels or packages of Mao products. This will allow a barcode reading device to display data of that Mao product instantly, such as data about the manufacturer, nutrition facts, etc.

2.3.3 Consideration on benefits of consumers. For sustainability of Mao business, benefits of consumers have to be considered. These include values to be received from the Mao products and their fair prices.

2.3.4 Mao-loving mind. To be successful in the business, Mao farmers need to love Mao and prepare successors to continue their ideology. Besides, they need to make consumers impressed in Mao. A solution for this is to let consumers try practicing some activities related to Mao production, such as harvesting Mao, sorting ripe Mao fruits, etc.

2.4 Chain No. 4: The academic sector

Knowledge management in the fourth chain involves with the academic sector or a governmental sector by acquiring cooperation or support from public organizations in conducting research about Mao, Mao planting, Mao processing, and Mao marketing. These issues of research are needed in order to support Mao development or to answer questions from consumers. For example, when consumers have a question about crystals found in 100% Mao juice, the entrepreneur must be able to explain that those are Mao crystals, not glass, and not harmful.

According to the items of knowledge discussed above, a pattern of knowledge management on supply chains of Mao's route can be summarized. These components of knowledge management must be operated simultaneously and continuously in order to originate learning, knowledge utilization,

and knowledge enhancement. The 4 chains of Mao, namely Mao planting, Mao processing, Mao marketing, and the academic sector, have to be driven with the knowledge management process as shown in this following diagram.

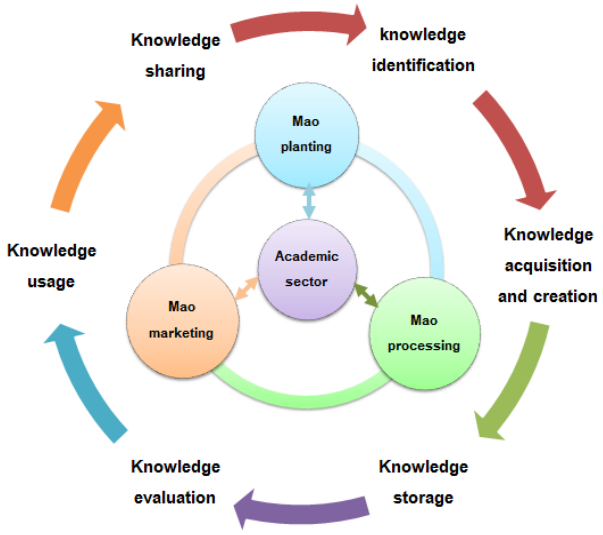

Figure 1 Model of the knowledge management on supply chains of Mao's route

Conclusion and Discussion

The knowledge management on supply chains of Mao's route consists of 4 chains namely Mao planting, Mao processing, Mao marketing, and the academic/governmental sector. All these chains have to be managed for success of the operation in terms of both quantity and quality. Strategies for the management include increasing Mao planting areas, zoning areas that are suitable for growing each variety of Mao, using a data recording system, developing Mao orchards to be learning sources and conservation sources of Mao breeds, inventing new products such as Mao zero, Mao soap, Mao facial cream, Mao jelly, Mao capsules, etc. Additional helpful strategies are creating interesting stories to support the sale of Mao products, maintaining quality of Mao products, having a coaching system, developing marketing strategies such as package improvement, online sale, English labeling on packages, and network creation. Another interesting marketing strategy is to categorize markets that are suitable for Mao products into premium market, niche market, and mass market. Information technology can be applied by placing barcodes on the packages. Finally, Mao entrepreneurs and Mao farmers must consider benefits of consumers and perform their work with a Mao-loving mind. Kuljittiwirach (2012) states that knowledge management leads to collection of knowledge data, origination of knowledge-exchanging networks, skills in developing products that

meet the market demand, increased income and strength of the group members. Therefore, for continuity of learning, knowledge utilization, and knowledge enhancement in all four chains of the knowledge management on supply chains of Mao's route, an efficient knowledge management process is required. This process must involve the knowledge identification, knowledge acquisition and creation, knowledge storage, Knowledge evaluation, Knowledge usage, and knowledge sharing. Prasertchai (2017) also expresses that knowledge management is a process of using and creating knowledge simultaneously by focusing on knowledge attached closely to the work and enhancing it via collaborative management of members who will then learn continuously. To generate and enhance value to the knowledge, it must be processed in all three dimensions namely research dimension, innovation dimension, and knowledge management dimension that are constantly changing and adapting. Liebowitz (1999) explains that a knowledge management process reveals procedures of knowledge management, from the beginning to the end, in maximizing benefits of knowledge toward the work. This process requires collecting and organizing knowledge, experience, and skills systematically. Nevertheless, knowledge management puts an emphasis on achievements rather than procedures; i.e. it is unnecessary to complete all procedures, depending on readiness of the operation.

Suggestions

1. One problem is the production of fresh Mao fruits is currently insufficient for being processed into products. Therefore, research should be conducted to determine appropriate areas for each variety of Mao that will allow effective administration on Mao production and ensure sufficiency of raw materials for Mao processing.

2. Training courses on Mao growing for local communities should be developed in order to transfer Mao planting knowledge to the next generation and expand the base of Mao growing.

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