



A Study of The Supply Chain of Orchids for Export, A Case Study of Suan Phueng District, Ratchaburi Province

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Abstract

This research aims to 1) study the activities in the supply chain of orchids for export, 2) study the problems and barriers of the supply chain of orchids for export, and 3) study the operational guidelines for the supply chain of orchids for export. The researcher collected data from primary and secondary sources. The statistical instruments were observation both the participation and non-participation, together with in-depth interview. The results of this research reveal that firstly, the supply chain of exporting orchids, showed the upstream was the orchid farmers, the midstream was logistics companies, and the downstream was markets and customers both domestic and overseas. Secondly, the activities in exporting orchid supply chain consisted of primary activities and supporting activities. Primary activities were inbound logistics, outbound logistics, marketing and sales, and after-sales services, including issues that concern minor activities, such as: plan, procurement, production, delivery, and returns. The results of this part showed that orchid farmers mostly started their business, by borrowing from cooperatives and the Bank for Agriculture and Agricultural Cooperatives (BAAC), as the method helped them to reduce financial costs since the interests from borrowing, were lower than other financial institutes. They invested their investment for purchasing raw materials and production processes, including transportation and after-sales services. Outbound logistics were about exporting activities, for example, to organize the distribution of products and services to customers. Moreover, marketing of Thai orchids is important to the orchid farmers, and the Thai economics as well. After all, the Thai orchids are well-known in the world. Therefore, orchid farmers and government sector have to concentrate on marketing and sales promotion for highly competitive market. They not only need to develop marketing and sales promotion, but also to develop the quality of Thai orchids and value chain also. However, to develop the quality of the Thai orchids, they need to use some agricultural technologies, for cultivation and quality evaluation, but, however, the farmers have to employ some experts to train their employees for matching with the international standards. Therefore, the overview of supply chain activities, concerned with financial support to develop orchid farm infrastructure links with production processes in the primary activities. Thirdly, there were some problems and obstacles in the supply chain of orchid export, for example, time-wasting, according to the transport from farms to international airports, and waiting time for custom process. Lastly, the operational guidelines for supply chain of orchid exports were the supply chain management, that the orchid farmers would set the organization chart, as the master pattern, for clarifying roles of the farm. The suitable plan would be constructed for short-term and long-term periods, that will enable to achieve the customers' needs, and eventually, the network building among the farmers, which should be necessarily formed, as it will help them to work integrally, share resources, reduce production costs, and increase marketing & distribution channels.

Keywords: *Supply chain, Thai Orchid, Logistics*

1. Introduction

The orchid is famous for people all over the world for its beauty and longevity. The Thai orchids have been well-known for more than 50 years, and are grown in wide varieties with internal standard. The main orchid breeds grown in Thailand are *Cattleya*, *Vanda*, *Rhynchostylis*, *Phalaenopsis*, *Dendrobium*, *Paphiopedilum* and *Landis*. Besides, there are many orchid experts in Thailand and the government has supported the technology development that helps developing the research continuously, for orchid tissues in the laboratory. Geographically, Thailand has enough natural resources, such as water for orchid cultivation for the whole year (Somporn, 2020). Thailand is one of the highest orchid exporters in the world, and the value of exporting volume tends to increase every year. The country is the first orchid exporter of the tropical area and the second one of world's exporting orchids after Taiwan. The National Orchid Board has developed

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a strategy for Thai orchid competition in the world market, in the master plan of 2011-2016, that has developed and promoted the Thai orchid industry, and maintain sustainable competitiveness in the world market. It aims to increase the value of orchid exports, with an average annual target of export of 19.24 percent of growth rate (19.09 percent of orchid flowers, and 25.31 percent of orchid breeds. However, in 2016, the target for exports was worth 10,000 million baht (Pimonratnakan, 2017).

Thailand's orchid export market is growing quite high, but it is growing in quantity not quality. Therefore, the Thai farmers and orchid entrepreneurs have to change the ways of their production processes qualitatively, that can help increasing the export value in the future. However, the nature of the demand for orchids and the actual demand of the market must also be studied. Our Thai orchid market is in highly competitive in the world market. Thai orchid farmers have to concentrate on the standard and product quality internationally. It is not only the orchids as flowers and the breeds but the processes after cutting are very crucial also, for example, packaging keeping in the proper temperature, transportation controls, and developing their orchid standard to fulfill customers' needs. Anyway, their needs change rather rapidly (National Orchid Board, 2016).

To study orchid supply chain management can help orchid entrepreneurs and exporters manage their production processes efficiently and effectively. Orchid supply chain will show the upstream, midstream, and downstream, respectively, including the activities inside them. Besides, they can learn to compete with the rivals abroad through the marketing plans, and be ready to prepare the after-sales services for customers. There are many provincial areas near Bangkok, that have cultivated orchids for export, such as Nakhon Pathom, Samut Sakhon, Kanchanaburi, and Ratchaburi since they are situated near the wholesale markets and it is easy for overseas export.

As mentioned above, the researcher is interested to study the supply chain of orchids for export in Suan Phueng district, Ratchaburi province. Furthermore, this research will result in, as the application for whom may concern, to learn the orchid supply chain management and its networking from the upstream through downstream.

2. Objectives

- 1) To study activities in the supply chain of orchids for export in Suan Phueng District, Ratchaburi Province.
- 2) To study problems and obstacles in the supply chain of orchids for export in Suan Phueng District, Ratchaburi Province.
- 3) To find out the operating guidelines for the supply chain of orchids for export in Suan Phueng District, Ratchaburi Province.

3. Materials and Methods

This research is a qualitative research. The researcher collected data from secondary data sources and primary data sources. The statistical instruments were participation and non-participation observations, and in-depth interview. The key informants were selected from the Thai orchid entrepreneurs and farmers, who have at-least-five-year experience in Thai orchid industry, both domestically and internationally.

The processes of the study are as follows:

- 3.1 To collect information from documents related to orchid supply chain, from the source of production to Suvarnabhumi Airport.
- 3.2 To interview with key informants by asking orchid farmers who have at least 5 years of experience working in orchids for export. They must be able to provide information about activities within the orchid supply chain from the source to Suvarnabhumi Airport.
- 3.3 To observe the sample, both participate and non-participate, to understand what happen in the supply chain and the cost of transporting orchids from the source. The researchers engaged in the upstream, midstream, and downstream activities, by observation without participating, in the activities to see and understand the subjects to be studied.
- 3.4 To analysis of data to achieve research objectives as follows:



3.4.1 To study the supply chain of orchids for export from the source of production to Suvarnabhumi Airport from upstream to downstream

3.4.2 To study activities in the orchid supply chain for export

The Supply Chain Operation Reference Model (SCOR Model) consists of 5 main processes : 1) planning 2) sourcing 3) manufacturing 4) delivery 5) returns (Stephens, 2001; Charernklang, 2015). To study the value chain, which are activities within the organization, there are two activities : primary activities and supporting activities. The primary activities consists of inbound logistics, outbound logistics, marketing and sales, and after-sales services. The Supporting activities consist of procurement, technology development, human resource management, and firm infrastructure (Sritakeaw & Nimsai, 2013).

3.4.3 To study problems and obstacles in the supply chain of orchids for export.

3.4.4 To study the operation guidelines of the orchid supply chain for export.

4. Results and Discussion

Research results showed that

1. The supply chain of orchids for export.

From interviews with farmers raising orchids for export, it was found that 1) upstream, namely, orchids farmer, starting from orchids breeding in different methods, to obtain the desired characteristics and quantity of the orchids, This is used for harvesting orchids; which farmers may adopt self-fertilization. Attaching pods and seeding to achieve the desired distinctive characteristics or the use of spinning techniques to achieve the desired number of orchids in large amount, while other inputs can be classified as constant inputs, including houses, water system lighting systems and others. The inputs vary according to the number of businesses or the size of the farm or the number of orchids, such as fertilizers, various chemicals, baskets or planting materials, and labor, etc. 2) In the middle stream: the middleman and the freight forwarder, This must be done before exporting orchids, to bring orchids into the plant, keeping them dry, selecting and sizing, decoration and bundle Eliminate pests, reduce the temperature, as well as packaging. In case they are not for transport, they must be stored for transport to the airport. Lastly and 3) Downstream, namely, the market, which means customers or buyers of the orchids, both domestic and abroad.

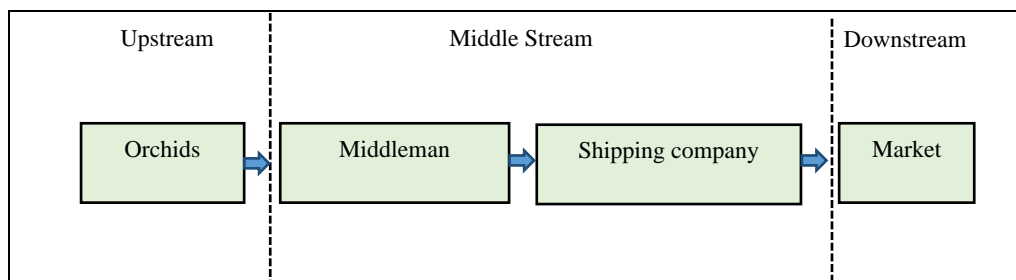


Figure 1 Supply Chain of Orchids for Export

From the orchid supply chain for export, it can be seen that upstream growers are midstream orchids, such as shipping companies and downstream markets.

2. Activities in the orchid supply chain for export.

From interviews for the activities in the supply chain of orchids for export, the supply chains for export orchids can be summarized as follows:

2.1 Plan: The growers must know there are assets, liabilities of orchid species, and areas for cultivating orchids. It is one of the factors that must be involved in investment decisions, and in the management of farmers, and most importantly, for effective orchid production. Because the orchid flower is a product that is easily perishable. Orchids need speed and temperature control to maintain their freshness on transit. These are a risk to the quality and price of the orchid, so to keep up with the conditions of current competition, farmers or export entrepreneurs should take supply chain management tools, to manage them more efficiently, in terms of reducing operating procedures.



2.2 Source in the procurement: The orchids farmers must try to purchase products from the same source whether it is an orchid species or various equipment required for use.

2.3 Made to order, in the production of orchids: The Farmers will produce orchids on customer orders.

2.4 Transportation for delivery: to Focus on the field of assessing the rights of exporter, can help the quality of orchids during transportation. The speed of transportation and transportation costs are found to be dominant in successful transportation. In the field of performance, number of vehicles and route expertise helps to ease transportation problem, it is found that the transport of orchids to the airport is the uncertainty in air-traffic conditions, causing the delivery of orchids to be delayed than specified, and causing a failure or problems in product delivery, due to full storage area. There is also problem of late arrival to the airport and too many products are on booking.

2.5 Returns: Most exporters have encountered problems with the quality of orchids and bruised petals, due to overcrowded transportation, causing the orchids harvested, unable to meet the export standards.

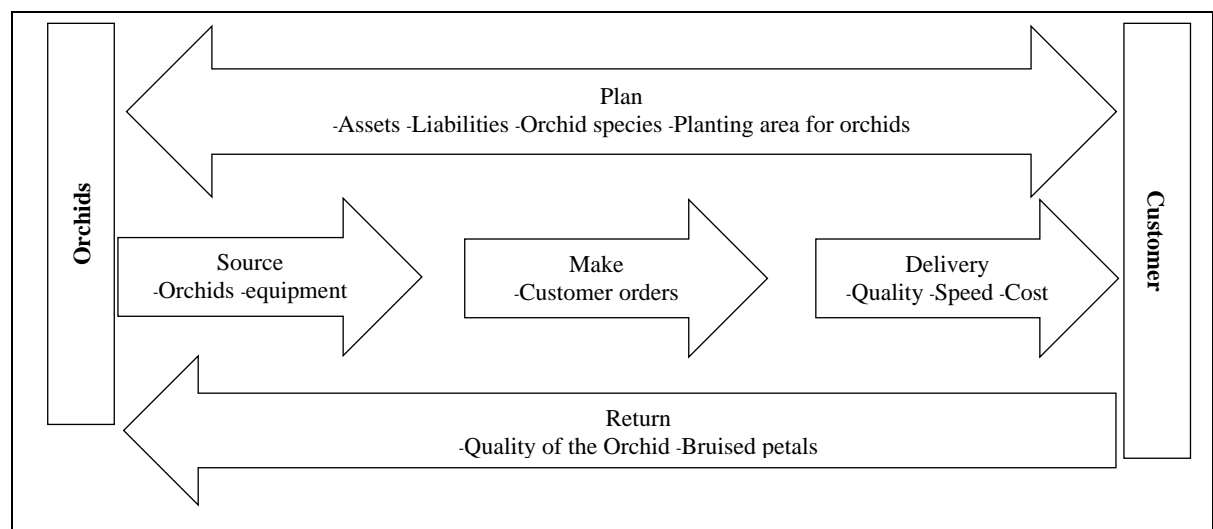


Figure 2 SCOR Model activities in the orchid supply chain for export

In terms of activities within the organization, it consists of 2 activities: Primary Activities and Supporting activities are as follows:

1. Primary Activities

1) Inbound Logistics. The source of raw materials is involved in cultivating orchids. Farmers will borrow money from cooperatives/ Bank for Agriculture and Cooperatives (BAAC) to invest in farming. By purchasing raw materials used in cultivation, from general agricultural product stores, or through cooperatives/BAAC, which may be purchased at a lower price than other stores.

2) Outbound Logistics in the distribution of goods Freight. The forwarders are responsible for arranging sales of products and services to customers.

3) Marketing and Sales (Marketing and Sales). The orchids is considered an economic crop. It is important in Thailand and the product is well-accepted, both by consumers from domestic and overseas. This results in a trend in exports for foreign countries, to be are very high.

4) After-sales service (After-Sales Services) generally in the export of orchids. Only farmers or some (large)entrepreneurs can check with leaders, to access to the quality of the orchids received, such as, whether the quality meets the needs or not and will there be any damage to the fruits during transportation etc.

2. Supporting Activities



1) Purchasing-Sourcing (Procurement). Farmers buy raw materials and various equipment for cultivation from farmers also, or general agricultural product stores. Sometimes they can be purchased from cooperatives/ banks for agriculture and co-operatives because they are cheaper.

2) Technology Development. There are some groups of farmers, who use technology to help cultivate and take care of their crops.

3) Human Resource Management. There are scarce labor in managing orchid farms and rare harvesters. At some point in labor shortage, there is also a problem for increasing compensation, by hiring workers from nearby villages or foreigners (a minority).

4) Firm finance Infrastructure. Most farmers borrow money from cooperatives/ Bank for Agriculture and Cooperatives (BAAC) to purchase orchid of varieties and raw materials. They include buying various things for cultivation such as fertilizers, pesticides, essential chemicals etc, at the place where farmers will pay back loans and interest to the cooperatives when they sell their crops to the cooperatives. Or, the crops can be sold through the middleman/ an/collector, and with information systems, farmers can receive various information of the cultivation from participating at cooperatives. As for the general management, farmers do not have a group or network, to claim together for the benefits from the middleman /collector/co-operative or from the government sector.

From the above information it can be summarized as a diagram of the value chain analysis for the value of orchids as follows:

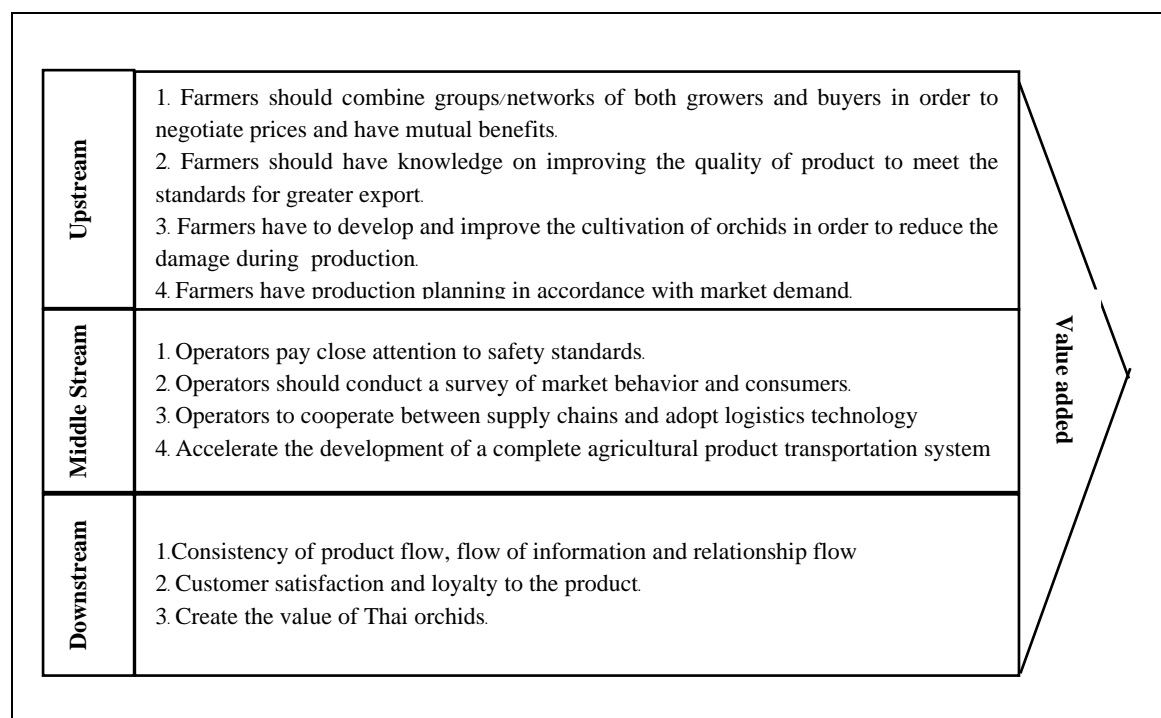


Figure 3 Analysis of Orchid Value Chain for Value-Added Solutions

3. Problems and obstacles in the supply chain of orchids for export.

From the study and research, it is found that the problems and obstacles in the supply chain of orchids for export are:

3.1 The storing orchids, waiting to be transported to the airport, is important, because when packing, there will be a period of waiting for delivery trucks to travel to the airport. During this period, there will be traffic problems and other problems, when planning a trip to the airport. As a result from this problem,



the researcher presented the research proposals from the supply chain. Starting from the process of orchids planters, there was a good harvest planning and time spent in the implementation work of good time-keeping, to harvest orchids that are right and ready, according to the principles of farmers. However, there will be problems, on the part of the exporters, in the waiting period, for the shuttle to the airport that there are problems in traffic congestion. Since we have these obstacles, the researcher suggested that each step of the process should be planned in the least possible time. By planning the efficient trip of the orchid transport truck, the operation is planned to deliver the products to orchid exporters or freight forwarders, by using geographic information systems, to assist the decision-making, in order to determine the best route for transport, which is fast and suitable for orchid delivery.

3.2 For export operations, when the orchid shipping company arrives at the airport, it brings the orchid to the cold room in the warehouse. And then it proceeds with the export formalities, which they have to wait in this section, to submit documents for orchid export. It will take more or less time, depending on amount the service personnel, the completeness of the documents for export, and the amount of shipping agents in the process.

4. To study the operating guidelines for the supply chain of orchids for export.

4.1 The Management should have organization chart for the group to clearly define the function.

4.2 Planning should be set up, according to the needs of the customer.

4.3 Networking should be the integration of several orchids growers coming together, which will result in a reduction in production costs. Sharing of resources increases marketing channels and channels of distribution.

Discussion of results

From the research results of the study of the supply chain of orchids for export, a case study of Suan Phueng District, Ratchaburi Province. The results can be discussed as follows.

The study of the supply chain of orchids for export found that the manufacturing process of the orchid grown was a type of rattan. The house used to cultivate is a standard type, and there is a propagation method, using tissue culture method. For materials that are planted, they use coconut cladding, boats, or coconut cladding boxes, soaked in water source, or canal freshwater. This is good for pest prevention and control methods, as manual labor is applied. And there are two types of employment: permanent labor and temporary labor. For product storage, they have no less than 7 times flowers cutting, and the cut time is normally in the afternoon. The frequency of cut flowers is less than 3 times per week. After cutting flowers, the method of sprinkling water and the average yield is less than 6 bunches/plant/year. For transportation, channel sales are using the company export method, by selling the locations of plant, to foreign exports and stores. Importantly, the quality of flowers sold is highly considered, both by grading and non-grading. They must own the characteristics of good orchids, that can be sold in bouquets. By the price and criteria in pricing, it is set according to the market price, and there are two types of post-sale payments, cash, and credit. It has a way of transport and there is self-transport, by obtaining marketing information. It is a mater of self-study and production control method by increasing fertilization and reducing production cost using self-propagation method. This is in line with Thirawattanakul, R. (2010) research study, on the supply chain for export flowers cut, from Thailand to Japan. The objective is to apply flow charts, value streams, and performance assessments. To present a guideline for development of the Thai cut orchid from export supply chain to Japan, this was done by interviewing a group of orchid exporter representatives with freight forwarding company in-depth interview, as well as from taking notes in the actual study area. The research results found that there are major problems, arising in the supply chain, that export cut flowers from Thailand to Japan, which are low selling prices. There were impact from exchange rate fluctuations, traffic instability problems, and transportation areas. There were inadequate, quality problems of orchids, problems of product drop, and 27 classified activities in total, which took 50.99 hours, totally, with 88.66% of value-added activities and 2.10% of non-value-added activities. 9.24% is, thus, needed. The processes that could be improved include storage of orchids, waiting for airport transportation, and waiting for export process. Compared to its competitor, Singapore /Malaysia, we found that there are better operational procedures than Thailand, ie pest control. They are better in the transport of orchids to the airport and obtain Pest Free Certification as well as the period



of orchid transport from the garden to the Packing Plant Quality inspection, with the grading of quality and size. The researcher would like to propose a guideline for development as follows: to set the wholesale price of orchid to be the same standard for export throughout the year, reducing the period of pest-free certification, while the government and relevant agencies should support the orchid delivery, by providing a product release area for perishable goods, etc. For the operation of the orchid supply chain for export, it should consist of management planning, and it should be planned according to the needs of the customer. And for networking, this is in line with the research of Nakruang, D., Wattanayuenyong S., & Lekhawchit, N. (2017, pages 69-76), which study factors influencing the performance of community enterprises in Yala Province. The objective of this study was to study factors influencing the performance of community enterprises in the province. The research results found that financial and marketing management, and member characteristics, influenced the performance of the community enterprises, in Yala province respectively. Therefore, in driving community enterprises to good performance, they should focus on financial management on regular accounting of income-expenditures. That is to control production costs in order to reduce and to do marketing management, that should focus on developing quality products. With local identity, therefore, the development and promotion of community enterprises, in addition to the study of management factors, will create a product's value. It is so important that it should be developed in parallel.

5. Conclusion

The researcher found the supply chain of orchids for export, a case study of Suan Phueng District, Ratchaburi Province, in line with the needs of orchids growers. This can create satisfaction for farmers and is in line with the research of Prathunpong, N., Pattnakiat, S. & Sukprasert, P. (2013), who studied logistics management in orchid export. The objectives are to 1) study the pattern and cost of logistics in orchid exports, 2) problems of orchid logistics management, and 3) consumer demand for orchids in each country. The data was collected from 10 orchid exporters, by using the interview form. The statistics used for data analysis were frequency distribution, percentage, mean and standard deviation. The research results were found that the logistics model for exporting orchids of the samples was collecting orchids from the farmers who planted them. Then they are packaged at the factory, and the next step is to transport them to the destination of partner country. This is the cost of the logistics of orchids export, including the cost of warehousing, transportation costs, in this respect, the process of being transported from the farmer's garden to the production plant. These are factory steps for production to be sent to airport and procedures from airport to partner country with line selection procedure. For aviation, which is determined by the speed of the airline and frequency for each flight, to make the product to the destination on time. As for freight cost, the buyer will be responsible for the expenses, and this is in line with the research of Taewattana, T., Leelathawornsuk, M., & Peanprasert, K. (2018), studying the supply chain of Nam Dok Mai mango as export to the Republic of Korea. There are two objectives: 1) to study the supply chain of Nam Dok Mai mango products for export to the Republic of Korea, and 2) to study the problems and obstacles of the supply chain of Nam Dok Mai mango products for export to the Republic of Korea. The research will focus on the study of network activities involved in the supply chain, from farmers, collectors, and processing plants to preparing for shipments to the Republic of Korea. The study found that there are many people involved in the supply chain, including farmers. However, the community enterprises, collectors and steam factories, exporters the farmers emphasized the good agricultural practices (GAP) in the management of the Nam Dok Mai mango cultivation, enabling the quality of Thai Nam Dok Mai mango products to build credibility among consumers. On the other hand, the supply chain network of Nam Dok Mai mangoes exported to the Republic of Korea is not complicated. And there is no intermediary, who has the highest bargaining power (Focal firm), which makes the operation of the supply chain very flexible. While there are problems and obstacles in the mango product supply chain, it was found that off-season planting had low yields. The farmers have to use chemicals to accelerate the results. Resulting in high cost and containing chemical residues in all seasons, there will be an oversupply of mangos, causing the selling price to fall, and the exported products do not have a traceability system to farmers. Packaging should be redesigned to minimize damage from vehicle replacement and transportation at bad and substandard road conditions. The main obstacles for Nam Dok Mai mango products are hot weather and seasonal rain



resulting in mango does not respond, therefore it is unable to determine the exact date and time of the result. Moreover, insects and pests are more resistant to chemicals due to changing climate conditions. The key recommendation is that the government should help manage mango growing areas for export (zoning), which will lead to increased off-season production, and will also help prevent crop problems. In addition, it is consistent with the research of Maneerattanroongroj, C. (2013), studying the supply chain management of One subdistrict, One product Project. The objective of this study was to study the planning, procurement, production, delivery, and return processes of One-subdistrict One hand-woven silk products. And to provide suggestions for improving the operational efficiency of the operators, including the development guidelines for the supply chain of One subdistrict, One product of hand-woven silk, becoming the project of the professional group, in hand-woven silk finally in Nakhon Ratchasima province. This is done by selecting a specific sample of 21 groups in 4 districts, namely Chakkarat, Bua Yai, Mueang Yang and Pak Thong Chai. There was a collection of interviewing and analyzing Data with descriptive and quantitative analysis. The results of the research showed that (1) the occupation group planned for daily work from experience, based on the ability of weaving, then further planned to order raw materials and prepare for production. Also, no operational goals were set and no record-keeping was planned, (2) Most occupation groups purchase raw materials by cash from local suppliers. The criteria used in selecting a product is the quality criterion of raw materials. The criteria used in selecting secondary suppliers of raw materials is the case of purchase criteria. The raw material procurement process started with inspecting customers' orders and surveying the remaining raw material quantity and the quantity of finished weaving product. Then calculated the quantity of raw materials, that need to be ordered according to their own experience, (3) Most of the occupation with weaving as the main occupation, weaved silk according to customer orders. As for the occupation that weaving, as a secondary occupation, weaving silk for sale becomes production process that used villagers' labor. Finally, there is a capacity between 10,000–40,000 yards per year, (4) Fabric delivery professional group is set, to receive customers via public bus service, and have many representatives nationwide to attend the show.

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