PROCESS DEVELOPMENT OF THAI's OKRA LOGISTICS AND SUPPLY CHAIN MANAGEMENT FOR EXPORT TO JAPAN

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ABSTRACT

Abstract—This article aims to 1) searching the process development of Thai green okra logistics and supply chain management for export to Japan, and 2) evaluate the optimization of logistics and supply chain of the green okra producer and exporter group. The research method was used mixed method research among research and development (R&D), qualitative research, and quantitative research. The data were collected by using interviews from the sample 2 groups namely; 1) group of green okra agriculturists and 2) exporters group was 120 people. The exact number is unknown. The data were tested for content and analyzed using descriptive statistics and structural equation models. To make sure that the information is reliable and accurate. The findings found that 1) the development of Thai green okra logistics and supply chain management processes for export to Japan. The procurement of the product must be sourced from a supplier who is an agriculturist. By creating a membership system for a network of agriculturists to deliver products to the company. The collect and storage found that the agriculturists need to collect the product, deliver day by day, and the company stores in the cold storage room, the temperature at 8-20oCelsius. Moving and spreading within the country, it must be a short transport distance of 10-72 kilometers and export by air. For the reason that, the green okra easily bruises and does not last long. While, marketing and sales must focus on the international markets because of the high prices, and have a guarantee for purchase price from the company at 23-30 baht per kilograms. 2) Export customs clearance is focused on the detection of pesticide and chemical residues must pass. The company has to have an inspection room (Laboratory Control) to reduce expense and 3) the operational efficiency of the green okra agricultural product entrepreneurs, it was found that it could increase sales more. That is the agriculture would have a high profit of 40,000 - 50,000 baht. / Rai. The better product quality is a standardized product with export level quality. This was a result of cultivation using a controlled chemical with a GAP standard. The harvesting period was 45 days faster than other crops. The cost is cheaper because the company invests in seeds, fertilizers, drugs, and knowledge. Agriculturists invest labor. While reaching out to customers and closer relationships is green okra agriculturists (Supplier Tier1) and the export company (Supplier Tier 2) has a cooperative relationship in the middle level that dependence and mutual benefit.

Keywords—Logistics and Supply Chain Process Management, Green Okra, Export to Japan

INTRODUCTION

Okra has many healthy nutritional properties such as reducing blood sugar, acid reflux, and high folate content to help build red blood cells (Tencent Thailand Co., Ltd., 2016). The main areas of cultivated area in Thailand are located in Ratchaburi, Kanchanaburi, Nakhon Pathom, Suphanburi, Chiang Rai and Chiang Mai are products for export abroad (Sate Sampattagul et al., 2012). Japan is one of the most important export markets (Nation Broadcasting Corporation Public Company Limited, 2012). Nakhon Pathom province has cultivated an area of 5,812 rai in 2016, producing okra 7,995 tons (Agricultural Information Center, 2017), which increased okra production capacity reversed the decline in export volumes to Japan. Despite Japan's high demand, in 2017, okra export revenues decreased by 16.35 per cent from the previous year (Ministry of Commerce, Department of International Trade, 2017).

The problem of exporting green greens to Japan Currently, the problems faced by export operators in Nakhon Pathom Province are logistics management processes and inefficient supply chains for export. Such as the problem of procurement of okra both from the production method and from purchasing provide quality standards and meet the export conditions to Japan (Agricultural Farm, 2011). Collection and storage issues under product quality control and maintenance (Dhall et al., 2014), shipping and distribution issues to end receivers,

which increase transportation costs. Marketing and sales problems, not know about the marketing mechanism. There was a decline in exports of okra to Japan. (But still, deliver the frozen okra to Japan in Asian markets) (Sate Sampattagul et al., 2012) in 2017, exported okra worth 107.3 million baht, exported fresh or chilled okra valued at 248.6 million baht (Ministry of Commerce, Department of International Trade, 2017). Okra is among the 21 vegetables that require a residue certificate before exporting to Japan (Agricultural Farm, 2011), the problem of export customs clearance is very conditional and difficult for those who do not have experience. These problems have a negative impact on Thai okra producers and exporters.

As a result of this problem, implementing the concept of "Supply Chain Logistics and Value Chain Management" can help solve the problem of logistics and okra supply chain management. The logistics management concept involves moving, collecting, storing and distributing (Natpatsaya Sethachotsombut, 2016) with marketing. New product development, finance, customer service in the concept of supply chain management and the value chain concept that consists of Main and support activities will help raise the potential and performance of Thai okra agriculturists, producers and exporters.

RESEARCH FRAMEWORK

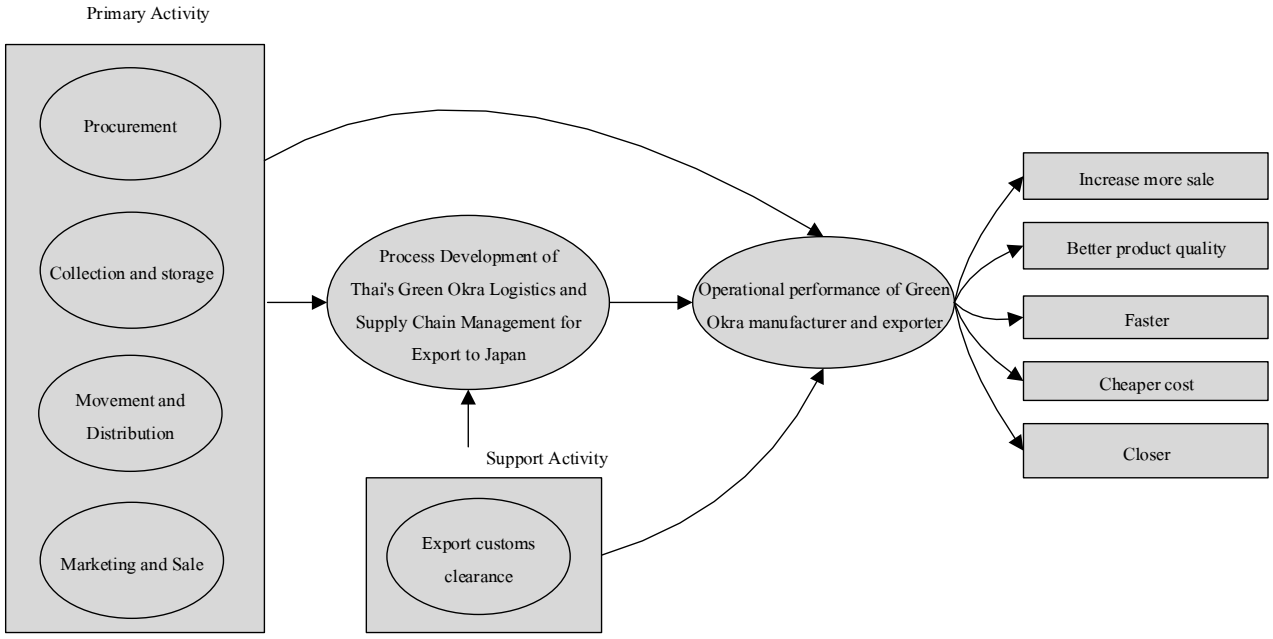

Figure 1. Conceptual Framework

LITERATURE REVIEWS

1. Process Design

Process Design is the process or method of operation. The process specification can be identified and described in order to be used in the systematic operation as a step to assess errors in each step, make improvements and the results can be tracked. Bring to improve the quality and the original process in which the design of the process will consider 3 stages: 1) Input 2) Process and 3) Output and apply it according to the PDCA process (Plan, Do, Check, Act). However, it is important to use tools to design processes that can clearly and accurately visualize the practice and easy to understand, such as Work flow Diagram and Flowchart Diagram in the Visio program.

2. Logistics Management

Logistics Management refers to the management of Material Flow and Information Flow in the product/service production cycle. The main tasks of logistics are "Movement, Collection, Storage) and Distribution. Typically, logistics focuses on activities that take place within the boundaries of a single organization and supply chain. "Procurement - Procurement And customer service" as well (Natpatsaya Sethachotsombut, 2016).

3. Supply chain

Supply chain refers to the network of companies, organizations, stakeholders that work together to deliver goods or services to the market. It is the lifecycle management of Product and Services that converts raw materials or materials into finished goods and delivers them to the final customer. The supply chain includes the logistics network and all logistics activities, more as Marketing, New Product Development and Finance activities.

4. Potentiality Enhancement

Potentiality is synonymous with efficiency. Potential is the ability to achieve an objective. By using resources Allocate resources to minimize waste so that Good Effectiveness (Natpatsaya Setthachotsombut, 2020) and the theory of performance. It also means the ability performance, in other words, when the performance is good. It can be called a high level of operational efficiency. The potentiality is derived from Greek and Latin. Which is consistent with strength, performance, ability, power, efficiency, strength, possibility and pushing. Potentiality enhancement, also known as capabilities enhancement, is a way to help organizations operate efficiently, control and management with quality (Farissi et al., 2020). It is also a way to create a competitive advantage.

5. Performance Measuring

Performance measuring of normal supply chain, this can be measured by 1) cost 2) time 3) quality 4) flexibility and 5) innovation and service (Martin, 2016; Martin, 2011).

The measurement of time and quality reflects the ability to provide customer service while measuring flexibility and innovativeness. It will reflect its ability to cope with rapid changes in demand (Natpatsaya Setthachotsombut and Wissawa Aunyawong, 2020) 6) delivery 7) durability and 8) tangible and intangible. In addition, the Improve Performance of the supply chain can be measured from indicators 1) a higher average sales growth, 2) lower costs, 3) lower inventories, and 4) value for customers in the supply chain. This indicates a company's operational satisfaction compared to its competitors, while supply chain business performance can be measured by indicators 1) profit enhancement, 2) market product and 3) shareholder return. However, the measure of supply chain performance should be measured against the big picture, such as sustainability and competitiveness, and financial metrics would be suitable for making strategic decisions. For daily operations measurement, it is better to use non-monetary measurement.

6. Planting green okra

Okra cultivation in Huai Monthong Subdistrict, Kamphaeng Saen District, Nakhon Pathom province has been cultivated for more than 20 years. By the group leaders established a group of okra cultivation initially planted with Ampol Food Company gave okra seeds to be planted. Searching for experiments in various types of plants and in 1992, Okra Has become an economic crop that continues to circulate, only 1-2 workers, 1 rai area, will be able to collect 100 kilograms of produce per day. Okra is a long-lived annual plant. It grows well in subtropical climates with temperatures between 18–35 degrees approximately. Okra is an important export vegetable in Thailand. Each year okra is exported. Fresh greens and frozen go abroad, with the main market being Japan, imports about 90 percent of okra from Thailand. In addition, okra is a useful and widely eaten vegetable, especially abroad. As a result, there is a company to export okra directly from Taniyama company, by collecting results from agriculturists around Don Tum subdistrict, Bang Len district, Nakhon Pathom province. Besides, Cropfy company limited is located in Bang Rak subdistrict, Bang Bua Thong district, Nonthaburi province, exporting okra to Japan. Purchased from agriculturists in Ban Yang subdistrict, Mueang district, Nakhon Pathom province.

METHODS

Using mixed methods between 1) research and development (R&D) and 2) qualitative research.

1. Population and Sample

The two research populations were okra growers and exporters. The exact number is not known, but the number is known in Nakhon Pathom, Bangkok and Chonburi province. The sample size determination and sample selection for Research and Development: R&D to transfer knowledge and apply a new management process to the experiment. There are 12 people and qualitative research of 120 people selected a specific sample.

2. Data collection

The research instruments were 1) the logistics and supply chain management process and 2) the interview questionnaire which was examined by five experts and collected by the trial and in-depth interviews.

3. Data Analysis

The researcher used the data from the interviews to check content integrity in conjunction with the conceptual framework of research and examining different sources of information, time, place and person. However, the researcher gets the same information, then take the data classification, according to the research objectives.

RESULTS

The research results are summarized as follows:

1. Development of Thai okra logistics and supply chain management processes for exporting to Japan.

1) Product sourcing will procure products from the supplier which is agriculturists in the area of Nakhon Pathom province by entering the membership system of the grower network to deliver the product to the company's price is guaranteed from the company, while the **planting** of agriculturists' okra cultivation is within specifications and company margins. By planting for export, the pod size is 8-10 cm long, the agriculturists must take care of the weed infestation and must use the supplied herbicides by using the GAP standard planting system which is a safe planting. **The cost of planting**, planting expenses the company is responsible for the expenses for the supply of fertilizers, the cost of drugs and controlled chemicals. The company has brought the drug to inject must be injected in the prescribed dosage only. If not injecting as specified by the company That is, if any member does not follow the rules, they must stop planting and leave the company as a supplier. Failure to comply will damage the agriculturists' produce, and planting costs such as fertilizers, chemicals, seeds are supplied by the company, thus the cost of the company. While agriculturists have the cost of planting area, Labor, people in care, harvest (harvest within family) for the tractor, but the planting will have to hit the pit to plant itself. However, the company's chemicals are not too strong. The drug will have a day-by-day effect must be chemical approved and provided by the company only if other than those provided by the company, notify the company first.

*In addition, **the procurement** of okra products for export, it is operated by a company that is a legal entity, mainly an intermediary for sourcing the production from multiple plants, to consolidate the order quantity. In which there will be a central warehouse as the focal point of product gather.*

2) In terms of collecting and storing, it was found that the agriculturists performed 2 rounds. Collected to be the number according to the bill specified by the company and the second round, the company collects foreign orders and keeps them under temperature control for export. Overall, it was found that harvested at the age of 45 days, wearing protective clothing while harvesting, most of which were harvested in the morning from 6.00-10.00 hrs. The collector must wear gloves, put them in a plastic bag while collecting okra to avoid itching, put them in a basket. Then select the results of okra to meet the standard for delivery to the company. **Sorting and rejecting**, in the harvest, agriculturists must sort the size, there will be a non-standard size selection and waste discard. However, in parallel during harvesting and sorting, gathering items that take up to 3 hours after harvesting from the garden will be placed in baskets. Move the products to the point of purchase of the company forward to the company. Okra is stored in a cold storage room temperature 18-20 degrees Celsius in the company's warehouse, but TANIYAMA company uses a storage temperature of about 8 degrees Celsius. The storage cost is 10% of the product. Every carton process is wrapped in a plastic bag before packing into a box of 40 packs, a total of 2 kg per carton. **Storage cost**, for agriculturists there are no storage costs because the product is not stored overnight. **Damage during storage**, no damage during storage, due to agriculturists delivered fresh results every day.

Besides, **collecting and storing** or receiving products that are vegetables - fruits (raw material) is mainly take the Reefer container to the vegetable-fruit plantation/company warehouse and dragged onto the boat in case of export by boat, the consolidation of fresh products takes 2-3 days. The operator will send a representative of the company to contact the supplier by collecting the products. They will coordinate to bring the products together at the central warehouse that is the central warehouse, load the products in the reefer container, and then move the container to go to the port. If the representative of the company can deal with the sellers/agriculturists If you get the whole plantation. The representative of the company can bring the reefer container to load the product on the plantation. However, the warehouse feature of the vegetable garden is an open area, pillar-like, and has a roof to escape the rain. It is an open-plan warehouse with only a roof. However, for the performance of work in the section, there are divisions of sorting products, packing products in boxes, and may be subjected to impregnation or dipping of the product into the solution. So, as not to ripen/rot, before the goods arrive at the destination. Especially, durian needs to be moistened with the substance. Immersed in the whole durian thus as not to ripen/rot, before the goods arrive at the destination. However, agriculturists or gardeners can develop the potential to be a trader for exporting products abroad. Nevertheless, it must be established as a company to be a legal entity first and to increase the ability to collect items from many plantations to meet the quantity and quality requirements of the end customers abroad. While exports can be used by freight forwarder service users to act instead of things agricultures do not have expertise in.

3) Transport and distribution, for **packaging**. After harvesting, agriculturists will place okra in baskets, when delivered to the company, they will clean and pack well, 100 grams per pack, and then put down into a box again. **Transport for transfer into a vehicle**, around noon every day, everything must be completed before 3 PM. The company will pick up okra at the agriculturist's garden that cultivates it for the company by loading up the truck, adjusting the temperature by labor. **Transportation**, with domestic shipping, trucks are temperature-adjusted, while international shipping uses air-by-plane transportation. **Damage during transportation**, the product had been damaged during transportation due to the dripping air, causing the rotting of the okra fruit and overlapping packaging boxes resulting in bruises and damage. Also, a box that is a paper crate water leak makes the box leak. **Transport distance**, the distance carried from the company to the okra plantation is approximately 10, 30, 72 kilometers. The company comes to buy and carry the freight for forwarding to Japan. **Transportation cost** Some agriculturists now plant directly for Japanese companies. It is absent from agriculturists' transportation costs. Since the company arrives at the place, there is no freight charge. However, the company will transport to the warehouse to wait for orders from Japan. The cost of transportation from Thailand to Japan is the company's business information, so the exact costs are not known. However, some companies have transportation costs 1,000 baht per lot and transport them to Suvarnabhumi airport for export to Japan, transportation costs are 3,500 baht per lot.

In addition, moving and distribution, fresh vegetables, and fruits such as okra. In the case of shipping by sea, it will use a Reefer container. Fruits and vegetables must use a Reefer container freezer. The temperature used for fruit and vegetable products is -20 ° C, which can be adjusted down-to-increase as appropriate in each type of product. The cost of a reefer container is twice as expensive as a regular container, and exporters have to reserve a full container (FCL) to make it cost-effective for each shipment. Unlike ready-to-pack food delivery, it will use a normal container. However, for each delivery, the minimum is 3-10 containers. To the country of destination to distribute the products to that final customer or consumer. When the product reaches its destination, there will be an agent that is both the shipper side and the customer side agent proceed with further actions. Where agent refers to the agent operated where the agent of the courier company is the agent that receives the goods overseas. While the customer's agent is the intermediary agent to buy the goods from the destination where the agent is in the form of a company.

However, shipping using container ships, which is currently affecting the economy i.e., the Covid-19 crisis. The container prices are somewhat higher because foreign countries ceased production, slowed production and the economy slowed. Only China recovered the fastest from this situation, consumer products most of the world comes from China. Container containers are produced out of China and are distributed all over the world. While the countries with purchasing power are Europe and America, the containers from China are therefore concentrated on the European side. And due to the shutdown, production slowing down, to get the containers back. They had to hit the ship to get an empty container which immediately resulted in higher costs. Therefore, the problem of container rotation is that it has demanded more than supply, resulting in the freight cost go up as well and standing for container prices can be done on a weekly basis. It is different from price standings in extremely normal situations. Affect the performance of the ship's marketing department directly. Including the export of entrepreneurs as well and when compared to the normal situation. The return trip of the container found that the outbound direction will continue to circulate to other countries (second country, third country), which manages the ship's container line. This container is a container from the FOC.

For shipping rates, charged as a container, different from the cost of air freight, cost in kilograms. Therefore, the cost of fresh vegetables is somewhat higher because of the multi-layered packaging elements such as boxes, crates, foam and dry ice, which adds up to extra weight.

Example Case 1: If the operator wants to deliver products from Nakhon Pathom province of Thailand to Japan, the freight forwarder will be charged as follows;

- The price of a container for 1 container, the calculation is at the cost of an air-conditioned car, about 9,000 baht.
- Shipping cost to Japan is 2,000 coins, about 60,000 baht.
- Shipping cost about 5,000 baht

The total amount is about 74,000 baht/cabinet.

Freight forwarder service of each company prices is not much different because customers will use the service, they must compare prices anyway.

4) Marketing and sales for **the domestic market** other than the wholesale to the department store. Supermarkets, Thai markets, or general retail. They are also sold through the website, Facebook and other online channels. If the product meets organic standards, there is another website to help promote organic products. For the most part, domestic distribution sources, agriculturists only sell okra that does not meet the criteria for foreign orders, such as the size of the fruit that exceeds the company's threshold. The company determines the size 8-12 cm to be sold in the Nakhon Pathom market with a female seller to buy at a price of 15 baht per kilogram. **Overseas market**, contract as a member network, grow and sell to any company both Thai and Japanese companies, which is a large

company. Insurance, the purchase price is 25 baht per kilogram or 23–30 Baht, export size 8-10 or 8-12 centimeters. Exporting to foreign markets is a difficult process and strict control of pesticide residues. Therefore, must have expertise in performing the job but get a higher price than the domestic market. For the most part of Japan, it is very popular because it is healthy food. The major okra exporting companies such as Taniyama Company Limited, Ampol Foods Company Limited, and Cropfy Company Limited.

Besides, marketing and sales. International marketing Operator way will send sales representatives to the fair as a social event, which will allow entrepreneurs to set up a booth and allow customers to come and see. Which is organized both within the country and abroad.

2. Export customs clearance for **chemical residue inspection** will check both the departure from Thailand and the arrival of Japan. As okra is on the list of 21 vegetables that need to be tested for pesticide residues before export. The process of the company to operate is that the company employees wash okra and import processes for sorting, size, put in the basket and Pack with not to bruise the product (Do not have any pressure marks). Refrigerate the pack in a box according to size. Then enter the system of logistics, goods through the border through customs clearance (need to prepare documents by skilled company staff, in order to reduce errors and waste time in problem-solving). Which usually Inspection of chemicals for every lot in export, costs 3,500 baht per time. The inspection is performed twice a month and has been issued certificated to certify the chemical test results that meet the criteria specified by Japan and also have a GAP certificate.

In addition, **export customs clearance**, chilled and frozen agricultural products to foreign countries will be exported in two main ways: airplanes and ships. Where most of the main modes of transport used by Thai entrepreneurs It will be a ship, which will have agents (agents) around the world, according to foreign inquiries, agricultural products that are exported and need to carry out customs clearance, including fresh vegetables such as okra, fresh fruits such as durian, pomelo and mango, including ready meals. Export formalities, the operator is the employer of the courier to arrange the export or let the freight forwarder company prepare the documents for the documents including.

1. Outgoing feather leaves
2. Application for Permit
3. Phytosanitary Certificate
4. Agricultural products that need to be checked for chemical residues

However, the problem of exporting fruits and vegetables is the quality of the product, when the goods are delivered to the destination country. The product has deteriorated and spoiled because fresh products are uncontrollable. In this regard, insurance claims depend on the operator's agreement. That there must be an agreement to come together, what kind of incoterm is used in the international trade and movement agreement. Which must refer to the initial conditions of the agreement, including insurance conditions, for some products, insurance companies do not take insurance.

3. Performance of Okra Agricultural Product Operators

1) Increase more sales Planting for export is better than selling it in the country to get both quantity and better price but must follow the chemical, size, and quality requirements. Planting 1 rai takes 2-3 people to take care of it. If planting friends that are more than 3 rai or more, they need to hire more workers. Agriculturists have to make a submission contract and do not hit the product back when the expense has been deducted. Agriculturists will have a profit of 40,000 - 50,000 baht / rai. The main expenses are wages for 2 people, agriculturists never account for income and expenses but will collect the bill to send okra by day with complete clarification details sent by the company. Receiving money from the company is received weekly, while some companies' profits are between 600,000 - 800,000 baht per month. There are 25 employees in the company, there is a clear accounting of the income and expenses of the company.

2) Better product quality

Standard products, export quality as a result of growing using controlled chemicals, GMP standard and IFOAM factory. The okra was never returned or bounced. From the cause of not passing the quality criteria, the company graded the quality of the fruit as weak, not bruised and the chemical was in the criteria.

3) Time faster

The harvesting period is faster than other crops (e.g., coriander). Most of the crops are grown in the area of Kamphaeng Saen District Nakhon Pathom province for export to Japan and wholesale in the Thai market.

4) Cheaper cost

The cost of planting is not high. Most of the companies invest in seeds, fertilizers and drugs, in which the growers have planted networks and delivered to the company, the majority of the agriculturists' costs are labor.

5) Reach customers and closer relationships.
Relationship of okra growers (Supplier tier1) with export companies (Supplier tier 2), having a cooperate relationship with medium level cooperate is a medium level collaboration, relying on and having mutual benefits, for some growers have started to deliver products for.

CONCLUSION AND FUTURE WORK

The results of the development of Thai okra logistics and supply chain management processes for export to Japan are shown in Figure 2.

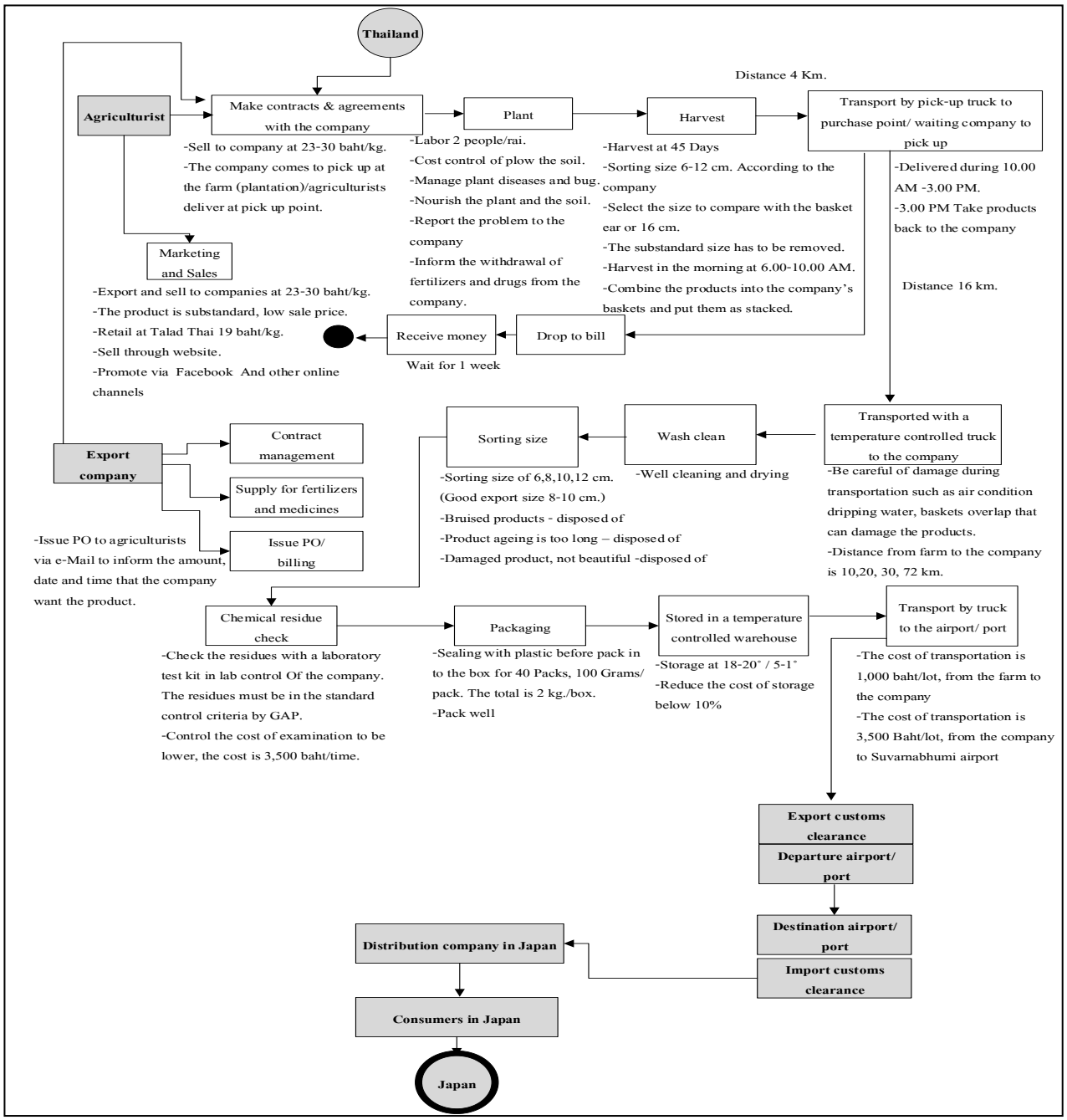

Figure 2. Process of Thai okra logistics and supply chain management for export to Japan

From Figure 2, the results of the research can be discussed as follows.

- Procurement of products found to supply okra for export to Japan It is operated by supplying products from suppliers. Which is a grower in the area of Nakhon Pathom.

It enters the membership system of the grower network to deliver the product to the company, with a price guarantee from the company in line with Chiewcharn Rattanamahattana (2016) who said that effective procurement techniques must be analyzed and used. Therefore, to procure okra fruit products by building a network of grower members, to plant for the company, then the company can control the quality of planting. There are sufficient quantities of products ready to be delivered to the company. It is an efficient purchasing technique.

- Chemical residue inspection found to be inspected both departing from Thailand and arriving in Japan. As okra is on the list of 21 vegetables that need to be tested for pesticide residues prior to export. The process of the company to operate is that the company employees wash okra, import the process of sorting, size, put in the basket and pack to prevent the product bruised (Do not have pressure marks). Refrigerate pack by putting in the box according to size and enter the system of logistics (Logistics) goods through the border by carrying out export customs clearance. The export company will be responsible for the cost of the chemical residue inspection. The export company must have a residue certificate according to the results of the inspection and analysis of the Department of Agriculture or other laboratories certified by the Department of Agriculture to show to the Customs Department for exporting out of the Kingdom. Usually, chemical testing for every lot in export costs 3,500 baht per time, twice per month. Certificated has been issued to certify the results of chemical testing that meet the criteria set by Japan and have a GAP certificate. However, in the event that some agriculturists want to check the chemical residues themselves, they will be responsible for purchasing the test kit or the cost of the inspection. There is no help from outside agencies because it is a matter of trade. Furthermore, the problems encountered in exporting are substandard products. This makes it impossible to export and has to be sold as a discounted grade at a lower price to correspond to Nation Broadcasting Corporation Public Company Limited (2012) (Nation Broadcasting Corporation Public Company Limited, 2012) that said, it must be checked product standard review and certificates to meet export conditions.

- The gathering found that collecting the desired quantity of objects only uses a wide-open space within the shade, such as in the house, under the house, etc. Since gathering items take up to 3 hours after harvesting from the garden. Okra will be placed in the basket and move the product to the point of purchase of the company or waiting for the exporting company to pick you up from the garden. Moreover, the collection from the garden to the point of purchase and from the point of purchase to TANIYAMA is packed into white baskets and stacked in layers. When it arrives, the company will pack the packaging by putting it in boxes and crates and the weight in every box must be the same. The storage or warehouse will be the duty of TANIYAMA Company as the operator. According with Nation Broadcasting Corporation Public Company Limited (Nation Broadcasting Corporation Public Company Limited (2012) and Nonglak Lueangwilai (2012) mentioned that, collecting and storing produce, must be brought to the vegetable shed as soon as possible. A well-ventilated vegetable shed, could be a mezzanine with a roof.

- Storage found that warehouse and cold storage products are only available for the company while farmers do not have a warehouse. Therefore, store products only for a short time, not more than 3 hours for forwarding to the company. Okra is stored in a cold storage room temperature 18-20 degrees Celsius in the company's warehouse, but TANIYAMA Company uses a storage temperature of about 8 degrees Celsius. The storage cost is 10% of the product. Every carton process is wrapped in a plastic bag before packing into a box of 40 packs, a total of 2 kg per carton.

Nevertheless, this research has discovered something new in practice, which is the management process, logistics and Thai okra supply chain for export to Japan, which is shown above in Figure 2.

In summary, the development of Thai okra logistics and supply chain management processes for export to Japan. <u>Product sourcing:</u> operated by the company or the intermediary must be a juristic person supply of produce from many plantations. **<u>Collection and storage:</u>** focus on the collection of items according to the order quantity. It needs to be made quickly, takes 2-3 days as it is fresh and there is a central warehouse as a focal point for shipping. The reefer container will be taken to the company's plantations/warehouse, to load the cargo. The container must return to the port on time, if past the deadline, there is a fine. The product may be impregnated or dipped in a liquid to prevent ripening/rot. Before the goods arrive at the destination. **<u>Movement and distribution:</u>** reefer container, the temperature used for fruit and vegetable products is -20 ° C, can be adjusted down-to-increase as appropriate for each product. The cost of a reefer container is twice as expensive as a regular container. Each delivery minimum is 3-10 containers. Moving products from Thailand to the country of destination, the agent will be used to operate. Currently, Covid – 19 has a negative impact on container turnover, resulting in relatively high prices and there is still a shortage of cabinets. There is a demand for more containers than Supply, the shipping rate for 1 reefer container about 74,000 baht from Thailand to Japan. The prices of each company are not much different. **<u>Marketing and sales:</u>** send sales representatives to fair, booths are set up both in domestic and abroad. **Export customs clearance**, the operator is hired by courier to arrange the export or for forwarder companies to

prepare documents for: 1. Outbound transportation, 2. Permit 3. Phytosanitary Certificate and 4. Agricultural products that need to be checked for chemical residues. Moreover, the problem of exporting fruits and vegetables is the quality of the product, when the product has been transported to the destination country. The product is worn out and spoiled because it is fresh, uncontrollable. As for the claim, it must see mutually agreed on what incoterm is used and does the insurance company take the case to do insurance or not However, farmers or young people able to develop the potential to become a trader in exporting products internationally but must first have to register the company to be a juristic person.

Recommendations for the application of research results

For agriculturists

1. Agriculturists should find encapsulation equipment. During the harvest better than the present to reduce fracture and bruising of okra.

2. Agriculturists should find cooling equipment. Avoid hot winds to reduce spoilage and reduce the color change of okra to keep okra fresh.

3. Management problems in the farm. Agriculturists should have a record of income and expenditures because they will know what parts of the pot that is used to manage the plantations, can be used in order to be more systematic.

4. The problem of harvesting which is infested with insects should make an insect trap to reduce the insects. Drug lure insects may be used to enhance the insect trap so that more insects can become trapped.

5. Storage and transportation must keep up the temperature and transport quickly in order to maintain the quality and freshness of produce. By reason of the time to re-sort, the company will not have to have a lot of waste and reduce the time of sorting within the company, making the pack and delivery faster and when the time is sent out, it will make the product into the standard.

6. A one-time investment should be made in the purchase of a vehicle for transportation between plantations to the company's purchase point in order to reduce the transportation costs of outsourcing and may invest in a tractor to plough before planting to reduce wages because farmers have a good income of 40,000 - 50,000 per month can manage this money to be used to invest in tractors and trucks. This will save the wages that must be hired every time.

For company

1. Make transportation to have more systems such as preparing products in the form of product packs that more complete or does not damage the product during transportation. During transportation, the driver of the truck must not drive more than the limit specified by the company in order to greatly reduce the damage from transportation.

2. Should find equipment used in transport to reduce breakage before reaching the warehouse

3. In transportation to Japan which takes a long time. The company should find packaging that can keep cold for a long time and find a foam backing to reduce the deposition to maintain the freshness and spoilage of okra.

4. The company should study the feasibility of transportation by boat because it is cheaper than transport by plane and can load the number of goods although it will take longer.

5. The company should check the packaging carefully before exporting the product. Thus, the product will not be damaged again.

Future Research Direction

The company should study the process of importing goods in the land plan at the customs of the departure and arrival, study more thoroughly methods to reduce errors reduces document edits and bounces.

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