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Logistics and Supply Chain Management of Water Chestnut Farmer Group in Suphanburi Province

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Abstract

This study focused on the development and community participation to improve farmers' ability and utilization principle. Effective integration of logistics and supply chain management, Supply chain among farmers, products were collected in Wang yang District, Siprachan District, Suphanburi Province. The purpose of this study was to study the relationship of supply chain, middlemen, and supplier. According to the requirements of customers, the factory provided high-quality raw materials, timely delivery and safety. Problems and obstacles in the supply chain are noted. This study used qualitative method - in-depth interviews and observation methods to study the correlation of the chain. The supply chain is the raw material supplier, middlemen, and the collection of products delivered to the factory based on demand. SCOR model is the theoretical model of the supply chain operation reference model in order to ensure high-quality raw materials, on-time delivery and safe use. The qualitative data were employed to develop questionnaires in order to determine the form of communication to create awareness about of identity water chestnuts in Suphanburi Province.The 400 samples were obtained by female, 250 representing 62.50%, Male 150 representing 37.50% of age range 21-30 years, 144 people representing 36.00% of the profession, trade, or employed 108 people, representing 27.00% of the graduate. BA 152 people, representing 38% and have been known to communicate frustration. Plants identity of the offense 250 percent from 62.50% a form of communication that creates awareness about frustration. Plants identity of the province as a whole is at the highest level ($\overline{X}$= 3.86, SD = 0.75) the findings show the need for the water chestnut to be recognized through internet/social media and is ranked No.1 method to create awareness. The second method to create awareness is through the mascot.

Introduction

Regarding to non-cycle dynamic of the current economic and social volatility, new things developed rapidly that destroy our mundane habits. The human is rushed by external environments which impact on the industries sector and SMEs business, including manufacturer and consumer. In each business activity, it is a chain reaction. For example, when impacting a loop,

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it affects the whole system. Thailand's economy is based on the directions of the National economic and social development plan No. 12 (B.E.2560-2564), a continuity with the original vision of development plan No.11 framework for planning that embraces the philosophy of sufficiency economy. Sufficiency economy philosophy is focused on people as the center of participatory and balancing the development and sustainability. The vision of the development plan in No.12 has an emphasis on development orientation towards transition of Thailand from a middle income country to a higher income country (4.0), leads to long-term plans (20 years) "Stable, Prosperous, Sustainable" which focus on valve-driven and innovation digital.The development must focus on agriculture in order to make people in the agriculture sector gain higher income.

Thailand is an agriculture country (with 70 % of the land being) used to grow agricultural products. The major occupation or 79% of population are employed in the agriculture sector. Suphanburi Province is well known in producing water chestnuts. The farmers are mostly located in the Tum bon Wang Yang and Mod Dang Districts. Suphanburi Province is located in the central region of Thailand where the Tar-Chin River flows through from north to south. The total area of Suphanburi is about 3,348,755 rai which are mostly flatland, and used for agricultural 2,315,389 rai, (Office of agriculture Economics 2016). The soil condition is suitable for farming such as rice farming, plants and fruits. Suphanburi requires the natural water used in agriculture including Tar Chin river,Kra Saungcannal, KlongJarakae-Samphan and other water sources. The 5 major economic plants are rice, sugar cane, mango, water chestnut and cassava (Suphanburi Province Agricultural and Cooperative Office, 2009)

Figure 1 below shows the supply chain structure for this study of water chestnut farmers and processors citation It can be noted in figure 1 the flow of data from farmers to consumers and that 80% of harvest yield is sent to middlemen with a quota system. Middlemen will buy raw water chestnut, hire peeling workers then deliver to the canned factory, small boiler and then deliver to Bangkok and elsewhere. The 15% harvest yield belongs to the processing group including community enterprise group, Wang Yang Cornflakes group with 5% delivered to retailers and local shops. From the current crop about 2,000 rai estimated yield 5 tons per rai, purchase price of raw water chestnut is 160 Baht/15 Kilogram the value is estimated at 42,666.67 Baht/rai, production by season 2,000 rai the value is pre season about 85,333,340 Baht.

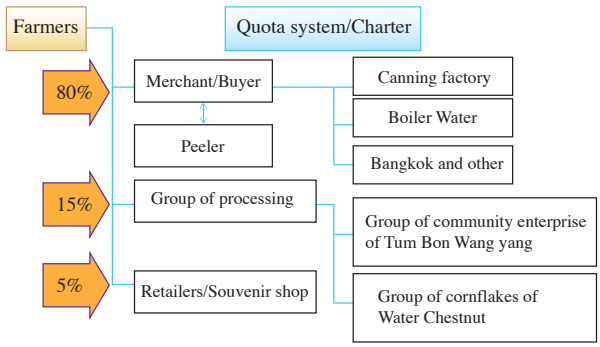

Figure 1 Supply chain structure of water chestnut by the production group

In addition, the research results from the field and in-depth interviews found the cost of each activity of the process is about 30,000 Baht/rai and important issues for farmers is the need to gain knowledge regarding reduction of chemicals used in order not to destroy the environment and farmers want support in processing including the distribution channels from the government.

Head waters: The farmers need support for plant species from the original plant species to buy seeds from China. Currently there is no support in Thailand. The source of funds is sought from informal funds because farmers do not qualify for loans from financial institutions.

Middle water: The knowledge of reducing non-destructive chemicals. The farmers are well aware of the impact of chemical fertilizers but there is no knowledge of how much organic fertilizer is used to produce the same quality as the chemical fertilizer and the head of fresh is not worth the cost. The farmers want higher prices when costs rise or the price insurance is similar to rice farmers.

End waters: The knowledge of processing is still small including distribution channels is limited to 2-3 merchants and to the area 3-5 times, it was found that the water chestnut is not widely known as a kind of plant. That is the identity of Suphanburi Province, with Geographical indication (GI).

However, considering the problems of the farmers and the processing group found that the price is the main issue. Acknowledging the competitive advantage there is only one source in Am Phoe Sriprachan, Suphanburi Province. By comparing planting in other areas such as

Kanchanaburi, Uthaithani the yield and quality are not as good as Suphanburi. This is due to Suphanburi Province having a suitable soil layer for growing water chestnut in terms of increasing the market value. There is a need to create awareness for customers to accept the brand and pay a higher price.

Objectives

1. To study the links in the supply chain between farmers raw product suppliers, and processed manufacturers in Wang Yang, Phoe Sriprachan District, Suphanburi Province.

2. To study the relationship in the supply chain of raw material and middlemen who supply the selected raw water chestnut to the factory according to customer needs in order to deliver the best quality raw materials, on time and safely.

3. To study the problems and difficulties of the water chestnut supply chain in Wang Yang, Phoe Sriprachan District, and Suphanburi Province.

4. To determine the form of communication for increasing awareness of water chestnut identity in Suphanburi Province.

Conceptual framework

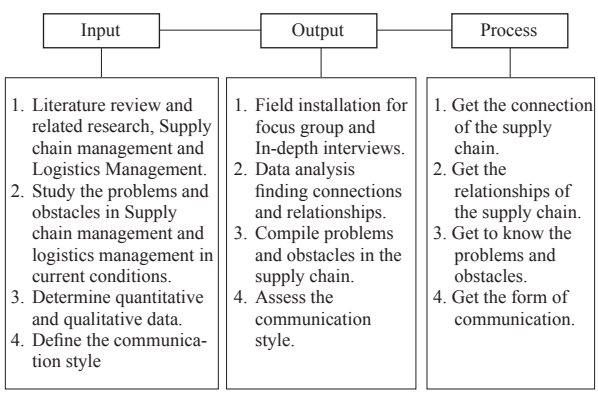

Figure 2 Conceptual framework

Research methodology

Population and samples

1. Qualitative research was conducted in order to explore the overall processes of the supply chain. Informants were selected only 1 person from each agricultural group in order to understand their experience and knowledge in regard to water chestnut production. In total, 34 people in Wang Yang, Sri Prachan District, Suphanburi Province were included in this study.

2. Quantitative research was also employed to understand how the identity of water chestnut in Suphanburi Province can increase awareness with consumers. The sample size used for this study was calculated by using a Hakone-based formula offering a confidence level of 95 percent. The data was collected by 400 questionnaires in order to determine the form of communication to increase to awareness about the identity of water chestnut in Suphanburi Province.

Research instrument

1. In-depth interview: the researcher collected the data of the growers, producers, entrepreneur and stakeholders using in-depth interview technique. The use of open-ended questions along with the telling story, the interviewees were relax and a friendly feeling with researcher was developed. The data from the interview consist of information about the input, process and output, and also, the problem and barrier within the supply chain.

2. Participated observation: the researcher closely observed the process of water chestnut seeding, planting, maintenance, harvesting, delivering, and peeling additionally, the study also explored the linkages in the supply chain between farmers group, processor to the entrepreneur.

3. Taking note: the researcher recorded all interviews carefully in order to get the data ready and reliability for analyzing the whole process of the supply chain. This also included suggestions and notices which the farmer required. The data were employed to synthesize systematically and carefully.

Collection of data

1. The researcher coordinated with Sergeant Anan Suankuhrap, the chairman of the board of Water Chestnut Production Group, for permissions and cooperation in collecting data with the farmers, entrepreneur and stakeholder of this research. Sergeant Anan Suankuhrap gave advice, knowledge of academic principles and integrated development concepts for trainees.

2. The researcher coordinated with farmer groups in Wang Yang, Phoe Sriprachan District, Suphanburi Province for clarifying the purpose, operating procedures and cooperation in this study.

3. Field data collection was conducted by in-depth interview and participated observation to meet objectives of this study. Quantitative research was also employed to discover the awareness process of consumers toward the identity of the water chestnut,

Suphanburi Province.

Data Analysis

In this qualitative analysis is a process of data analysis.The questionnaire, recording, interviews and participated observation were implemented. By implementing the data to follow the steps of qualitative analysis of farmer groups and entrepreneur in Wang Yang, Phoe Sriprachin District, Suphanburi Province, the researcher studied the supply chain process of water chestnut from the farmers groups who are related with the products from seeding to delivering to customer.

In this study, the researcher selected the area Wang Yang, Sriprachin District, Suphanburi Province as a place to study the logistic and supply chain management of the water chestnut farmer group, Suphanburi Province. Because it is the area where most farmers can cultivate more effectiveness than other sources in Suphanburi Province. The researcher took the data from in-depth interviews and participated observation, and also questionnaires to analyze in order to answer the 4 objectives.

Results

Objective 1: The links in the supply chain between farmers group, collectors to processor of water chestnut in Wang Yang, Sriprachan District, Suphanburi Province. The beginning in the supply chain of water chestnut has been changed from the traditional Supply Chain to a Modern Supply Chain as shown in Figure 3 below.

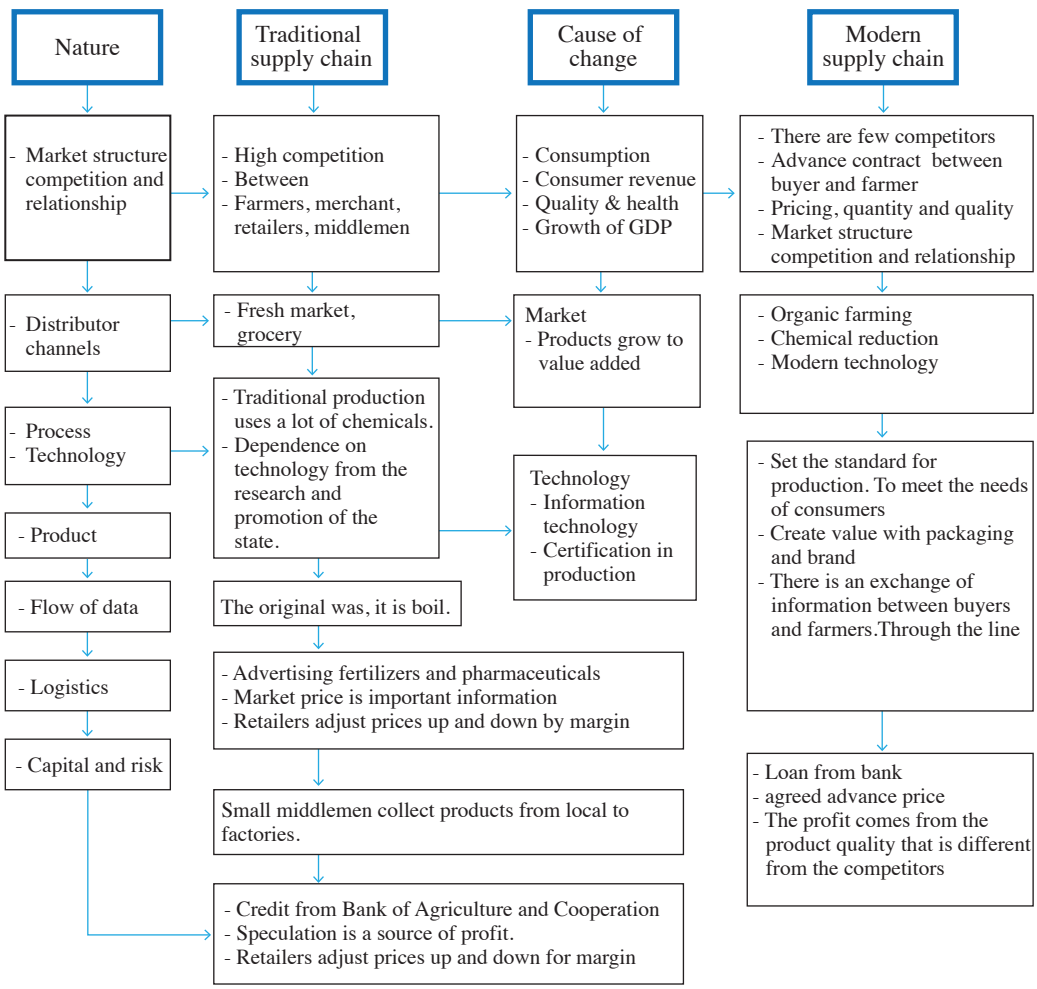

Figure 3 Changing the supply chain of water chestnut

In Figure 3, it is shown that traditional farmers focus on supply side. Farmers plant without knowing the market demand, how much does the market need? Mostly, they face problems with oversupply of products which they cannot sell. From the modern supply chain, farmers focus on demand, and their productions are based on market demand or intermediators'plan. From traditional marketing structure, processed products are highly competitive both for middlemen and for merchants. Within the modern supply chain, there are plans to sell products in advance between buyers and farmers. The quantity and quality are determined as well as the price. Because the growth of the market and information is important to the market mechanism. When the factory is planning the demand for raw materials in the long run, it is necessary for the collectors to find enough raw materials for meeting the production requirement. The collectors need to make relationship and contact with farmers in order to make a contract with the farmers in terms of quantity of annual raw materials. The systematic planning of all activities in the supply chain begins from the factory demand forecast that is communicated to the collector and it is finally informed to the farmers. When the farmers know the quantity of requirements and the inputs, questions are raised in this situation such as; Is there enough land to plant water chestnuts? If there is not enough land, where can they rent cropping area? How much can they increase its volume? Are there enough workers? If not, where can they find workers? Is there enough funding if not, where can they access a source of funding? The concerns also include tools and equipment used in the production process. In part of the production process: Is there enough water to grow? Amount of fertilizer and care throughout the plant lifecycle. The last concern is whether the output is enough to make a pre-contract with the collector. If not, to meet the requirement, how should they manage the risk?

The input: Farmer factor: Most have their own growing area and learn from the elders allowing the water chestnut farmer to create outstanding water chestnut produce and to become expert in water chestnut farming.

- Raw material factor: The cultivars are from China and the seedling and planting method is similar to rice farming. The Sriprachan District soil condition is suitable for planting water chestnut. When planted, it will be combined in the ground which is convenient to harvest and the source of water used for cultivation comes from an irrigation system.

- Investment factors: Most farmers use the revenues from the previous year to invest in production for the current year. However, some farmers who have insufficient funds will seek loans from non-financial institutions with high interest rates, because only a small number of farmers are qualified to apply for a loan from the Bank for Agriculture and Agricultural Cooperatives, the government financial institution.

- Production tools factor: There are tools for general agriculture such as hoe, swarm, pump, lawn mower, insecticide, pushcart, etc. A machine was used to drop seeding in the planting area. The harvesting process is only done by labors.

- Operation management factor: The farmers have a management plan. They are experienced in adjusting crop time and harvest to suit the climate.

In process: Cultivating crops requires water at all times after planting 7 days. After 1 month, the insect and fungus are pesticide every 10 days. After 2 months, farmers apply fertilize by using the fertilizer mixes of 13-13-21 50 kg/rai. At the end of 2 months, farmers will spray fungi and insect pesticide and add hormone every 7 days. This process lasts for another 5 months. After 3 months, farmers will use fertilizer which mixes 13-13-21 and 0-0-60 intergraded 2/1 rai of 200 kg, every 15-20 days for 3 months.Insecticide is applied on the ground once a month. After 6-7 months, farmers will start harvesting.

Output: The water chestnut harvest period is 6-8 months after planting. If more time is allowed the output will be rotten.The harvesting method can be done by stepping into a lump, using the hands to the base of the water chestnut plant, putting in the basket, and soaking for 1 night.The harvesting method is done by hiring workers for 70 baht a bucket. Middlemen will buy the water chestnut in the quantity, quality and price as stated in the signed contract.

In the field work for this study, the collaboration between researcher and the collector group designed a modern supply chain that is related to all production activities from upstream to downstream and internal performance in the supply chain.

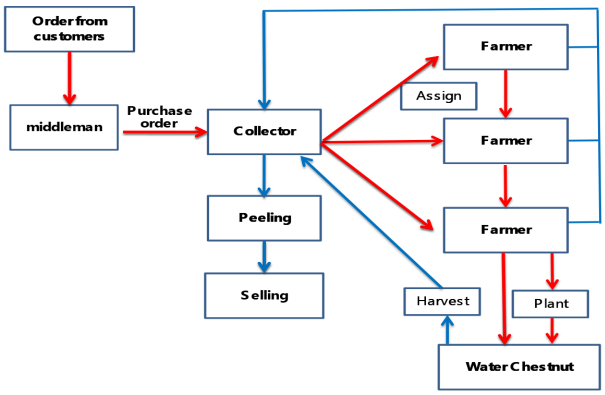

Figure 4 Operations in the modern supply chain

In regards to figure 4, the researchers found that the stakeholders in the process of operation in the supply chain; from the customer demand toward products, followed by issuing purchase orders to the middlemen. The middlemen have to plan production, and send the purchasing order to the collector. The collectors have 2 duties: Firstly, the collectors go to many farmers to get the orders from customer and to make a pre-contract with the farmers. The farmers have to plan from planting to harvest. The farmers plant water chestnuts according to standard and quantity agreed to with the collector. Secondly, when the collector receives the water chestnuts from the farmers, all of them will be sent to the peeling stage before selling to the market. Any water chestnuts left will be delivered to the middlemen. However, we can see that the stakeholders in this picture lack the delivery, which is the key. However, the delivery is a flow of data that begins with placing the purchase order from the customer to growers. The delivery process uses the arrow signs as a flow of inputs, production process and output.

Table 1 Qualitative changes from traditional supply chain to modern supply chain

Traditional Supply Chain	Modern Supply Chain
1. Farmers do different things.	Farmers are sharing with each other.
2. The middlemen are the pricing.	Price is negotiable.
3. Use Chemicals.	Reduce the use of chemicals
4. The process is the same.	Reduce the work process.
5. High risk.	Risk management.
6. Growth by the environment.	Sustainable growth.
7. Lack of trust.	Trust.
8. Overproduction, produce less.	Manufacture according to market demand.
9. Source of fund out of the system.	Source of fund in the system.

Table 1 presents what the researcher has discovered as qualitative changes from traditional supply chain to modern supply chain and is discussed as follows:

1. The traditional model is also different people follow their elders. The modern model is sharing information exchanges with each other in order to receive new knowledge of models used in production.

2. The traditional price was determined by the middlemen. When the modern change is made the price is based on the market mechanism with future contract.

3. When the yield decreases, the fertilizer is added to the chemical. The modern organic fertilizer is mixed in the cultivation.

4. Steps to produce the same as the inheritance. The modern data flow in the production factor reduces the down time.

5. The traditional planting is risky due to the climate change and flood that can cause the product to be unavailable. The modern planting needs to incorporate risk management in terms of price and crop insurance.

6. The growth of business is based on the economic environment. The modern growth from sharing allows for higher sustainable.

7. In the traditional, there was a lack of trust among stakeholders. In the modern trust is important to accumulate for long term relationships.

8. The traditional planting was planted along the same steps with uncertainty; sometimes large harvest and sometime less. The modern planting is based on customer orders, then produce according to the market demand.

9. The traditional source of capital is from high interest loans. The modern is produced by orders; therefore, they can be guaranteed by the government financial institution.

Objective 2: To study the relationship in the supply chain of water chestnuts to supplier of raw material, middlemen and collectors. The selection of water chestnuts delivered to the factory, according to customer requirements for producing the best quality raw materials on time and safely.The researcher has collected data from in-depth interviews of the supplier according to customer's order that causes the operation to be effective in supply chain management. The farmers create systematic plans to solve operation problems in the supply chain with Supply Chain Operation Reference or SCOR Model. This is a tool to help in the development of a supply chain, because the SCOR model was developed in order to describe characteristics and

The Supply Chain Management is important to the flow of raw materials and the data related to business operations in terms of efficiency and effectiveness. The Supply Chain Operation Reference or SCOR model is a tool for production management to balance the work process. In this process, it focuses on the production process of farmers in Wang Yang, Sriprachan District, Suphanburi Province. The SCOR model is composed of 6 activities. (1) Plan (2) source (3) Make (4) Delivery (5) Return (6) Enable.The SCOR model can describe the relationship in the supply chain of farmers as follows: (1) Plan, it is a plan to balance between demands and supply according to the need. It is a plan for farmers to plan factor inputs such as; planning to buy fertilizer, process planning, treatment, water source and output planning; (2) Source, procurement of raw materials used in cultivation to meet the needs of the plan. It also needs to maintain the relationship of the procurement process with other parts in the supply chain. The procurement must be accurate for example, do not wait for raw materials to run out ensure to buy sufficient amount of water chestnuts, the land lease is suitable for cultivation, the ability to buy standard quality fertilizers that is certified by a reliable agency; (3) make: the process of changing raw materials into products. In this definition it is the head of Water Chestnut Group ability to plant more crops. At this stage it is an important step to ensure the quantity and quality according to market demand. That is, farmer must have a new production understanding of how to change their behavior; (4) Delivery, the process of product delivery to the collector passed to the middleman based on the order from customer who has the contract that has been agreed upon in advance and delivery time is clear; (5) Return: the process that involves activity in each step to ensure there are no return of goods due to unacceptable quality.It is important that information should be recorded regarding returns and to note what caused the returns in order to ensure it does not happen again. And (6) Enable: it is smooth running processes include related activities beginning from input, process and output as well as risk management.

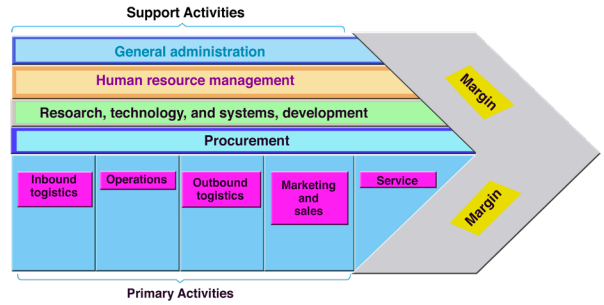

Figure 5 Supply chain management

In Figure 5 a theory of Supply Chain Management is shown. The division serves as a support and main line. The support line consists of (1) The management and planning strategies; (2) Human Resource Management HRM and HRD are important factors in the work; (3) Technology is dominated over competitors by digital information which helps to facilitate smooth operation; (4) Procurement is the procurement of correct and right material. The main line consists of (1) Raw materials procured for production (2) Process (3) Finished goods are kept in a warehouse; (4) Marketing and Sales: The selling of finished goods; and (5) Service, The product requires after sales service, it must be monitored and establish relationships with customer continuously. These concepts are derived from theory, and researcher has adopted the form of SCOR model as a tool to analyze the relationship in the supply chain of water chestnuts to supplier of raw material, middlemen and collectors' selection of water chestnuts delivered to the factory, according to customer requirements for the best quality raw materials on time and safely.This process focused on planning and logistics management in all relevant activities for developing excellence throughout the supply chain.

Although SCOR Model is referring to operations in the supply chain of water chestnuts, it is an administrative tool used to improve the efficiency of the supply chain. To bring SCOR Model to use for the water chestnut farmers in Wang Yang, Sriprachan District, Suphanburi Province successfully, there are important factors such as risk management, ability to make decisions and solve problems and discipline of agricultural group in Wang Yang. The process begins with farmers, supplier, entrepreneurs and transporters that need to adjust for growth and importantly to meet the needs of the consumer.

Objective 3: To study the problems and barriers in the supply chain of water chestnuts in Wang Yang, Sriprachan District, Suphanburi Province is discussed as follows:

Production factor: (Input)

1. The funding investment must come from non-financial sources system because famers are not qualified for loans from the financial institution; therefore, the interest rate is at a high rate.

2. Lack of workers on the farm; therefore, farmers need to hire foreign workers, but this is a problem of new labor law the farmers have no management fee.

3. The changes of traditional to the modern system are gradually, there is no quick change because the behaviors of traditional farmers are conservative.

Production process: The maintenance care is mainly about plant diseases and pests. Water is not a problem in planting water chestnuts because there are many sources of water in Sriprachan District.

Harvesting (output): When harvesting, the middlemen will buy volume and price agreed in advance based on the contract. If products are not sold within the end of the day, it must be soaked in the field to maintain quality or inventory. It will not be stored more than 3 months because it will not qualify for the market. Another issue in the problem of middlemen who are influential in the area and have created a monopoly among a few groups.

Objective 4: For determining the form of communication to create awareness about the identity of the water chestnuts from Suphanburi Province.The results of the data were analyzed from questionnaires in order to define communication to create awareness about Water Chestnuts identity of Suphanburi Province. Under research "Logistics and Supply Chain Management of Water Chestnut farmer group" in Wang Yang, Sriprachan District, Suphanburi Province" The result of the data analysis is divide into 2 parts.

Part 1: The results of general data analysis of the individual factors of the respondents.

Part 2: The results of satisfaction of the formulation of communication to create awareness about water chestnut identity of Suphanburi Province.

Part 1: The results of general data analysis of the individual factors of the respondents.

Table 2 General information of the respondents.

Personal Information	Volume	Percent
Sex		
Male	150	37.50
Female	250	62.50
Total	**400**	**100.00**
Age		
Lower 20 y	90	22.50
21-30 y	144	36.00
31-40 y	110	27.50
41-50 y	30	7.50
51-60 y	26	6.50
60 y Over	0	0.00
Total	**400**	**100.00**
Career		
Government employee	36	9.00
Trading	108	27.00
Agriculture	0	0.00
Employees	98	24.50
Hire	50	12.50
Student	90	22.50
Not working	18	4.50
Etc.	0	0.00
Total	**400**	**100.00**
Education		
Lower secondary school	54	13.50
High school	95	23.75
Vocational education	69	17.25
Bachelor	152	38.00
Master/Dr.	30	7.50
Total	**400**	**100.00**
Have you ever heard of communication of water chestnut identity of Suphanburi Province?		
Know	250	62.50
Unknown	150	37.50
Total	**400**	**100.00**

Table 2: The results found that most respondents were 250 women (62.50%), 150 men (37.50%). Most aged in 20-30 years 144 persons (36.00%). Most engaged in trading 108 persons (27.00%). Most are graduates are 152 persons (38.00%) and they were aware of the communication of water chestnut identity of Suphanburi Province 250 persons (62.50%).

Part 2: The results of the satisfaction of the formulation of communication to create awareness about water chestnut identity of Suphanburi Province.

Table 3 The results found that communication to create awareness about water chestnut identity of Suphanburi Province

List what do you think the formulation of communication through which media to create awareness about water chestnut identity of Suphanburi Province?	Average	Standard deviation	Translate	Rating
1. Brochures	3.76	0.95	Very much	4
2. Mascot	3.94	1.15	Most	2
3. Newspaper/Magazine	3.67	1.10	Very much	5
4. Internet/social media	4.53	0.72	Most	1
5. TV/Radio	3.35	1.02	Very much	6
6. AD/PR in travel Suphanburi	3.90	1.03	Most	3
Included	**3.86**	**0.75**	**Most**	

Table 3: The results found that communication to create awareness about water chestnut identity of Suphanburi Province in the highest level (X = 3.86 S.D= 0.75) and when considering the item, it was found the internet/social network has the highest and the next is mascot.

From objective 4 for determining the form of communication to create awareness about the identity water chestnut in Suphanburi Province, as mentioned in table 1 it found that most were aged at no more than 30 years, the new generation (57%) are a student and trading (50%). They do not know the water chestnut as an identity of Suphanburi Province and from the questionnaire, there are know the Water Chestnut is an identity plant, up to 62%. This is show that the new generation is well recognized. The result in table 2 shows the need for the water chestnut to be recognized through internet/social media and is ranked No. 1 method to create awareness, 4.53 from the average.The need for internet/social media is reflected in the high rate because in the present day the Smartphone can be viewed anywhere, anytime. It is major venue of creating awareness for the water chestnut. The second method to create awareness is through the mascot 3.94 from the average.

In addition to the formulation of communication to create awareness about water chestnut identity of Suphanburi Province, the researcher wrote a letter to the District Administration of Wang Yang, Sriprachan District, Suphanburi Province to inform that the public needs to see the water chestnut on internet/social media in order to create awareness.

Discussion

Research on "Management of Logistics and Supply Chain of farmers in Suphanburi Province" is discussed as follows:

1. To learn about links in the supply chain among farmers. The manufacturer has gone to the process of frustration in Wang Yang, Siprachan District, Suphanburi Province. The results of the research found the new supply chain model in connection with all production activities from the beginning of planting .The internal performance of the supply chain, begins when an order is made from a customer, the middlemen will send both the quantity and quality orders to the production collector. Farmers are required to develop production plans to be produced according to Tuangsuwan (2010), the needs of the logistics system and Thai rice supply chain, divided into three groups: water, water and downstream. The concept of studying logistics and supply chains using a model reference to supply chain operations (SCOR Model) of rice in Nakhon Ratchasima, is in line with the research in other types of agricultural production such as the supply chain management of the pineapple industry (Wasusri, 2007) and analysis of the supply chain management of fresh Longan Trader (Machimanon, 2008)

2. To study the relationship in the supply chain of the material supplier's frustration, the trader of the middle-producers selected yield raw frustration to deliver to the factory according to the customer's requirements in order to provide good quality of raw material supply, on time and good condition. The results of the research showed that (1) the original format is different, unlike their own ancestors, but the new model has shared the same data exchange. Learn new styles to use as a production template; (2) the original price is determined by the middlemen. When a new change is made, the price is based on the market mechanisms in which the contract is signed in advance; (3) When the yield is reduced, it adds to the increase of chemical fertilizer, but a new organic fertilizer has been taken with ingredients in cultivation; (4) the process of production is the same. The new flow of data in the production factor makes it a lower production flow; (5) the original planting is the risk of both climate and flood, the output is not as expected. The new cultivation is the risk management of the price and the crop insurance; (6) growth of business grows according to economic conditions. The new forms grow from collaboration, growing together with a lasting trust; (7) from the original, we can see stakeholders, but the new style of trust is important for a long time; (8) the original cultivation was planted in the same process. The resulting output is less effective, but the new form of production is planned from

the customer's order, and then produced according to the market demand. The original funding source is the loan from the interest-paid capital, but the new form can lead the order of guarantee to the financial institution of the public sector in compliance with Thoucharee & Pitakaso (2012) as well as Suchato, Bunyasiri & Kuldilok (2012) to analyze the supply chain of Thai rice to analyses the link and efficiency of the supply chain. Jasmine rice Bags

3. To study the problems and obstacles those occur in the supply chain of frustration, in Wang Yang, Sriprachan District, SuphanBuri province. The results of the research were found-aspects of the production factor; (Input) (1) Investments must be issued outside the system due to the borrowing in the system. Interest at a high rate; (2) The labor in rare areas is to hire foreign workers. There is a problem with the New Lab our Act. Farmers do not have money for management fees; (3) Changes to the original transplant system are rarely a sudden change. As the behavior of farmers made the same is still attached to the old -The manufacturing process (process) maintenance is largely about plant diseases and insect pests. Water is not a problem for cultivation because in Sri Prachan district, there is a general irrigation-harvesting side (Output) when the output is harvested. The middle merchant will be able to receive the purchase in quantity and agreed price according to the contract in advance, but if products cannot be sold within a day, farmers have to soak them. In a way to maintain the quality or the inventory, it will be within 3 months, because it will not be the preferred quality of the market. Another issue of a middle-person trader is to be influential in a monopoly area, just 2-3 groups in according with and Traisilanun & Thuannadee (2013) that there is a link in the higher supply chain.

4. To define communication patterns to create awareness of the frustration of the province of Suphan Buri, the findings showed that most respondents were female. 250 people think of 62.50% males, 150 people think of 37.50%, most of them are in the past 19-25 years. Each 36.30% of the majority of the professional trading or private business. 108 people think of 27.00%, most of the end of The bachelor's degree, which would have been a percentage of 38.00% and ever known to communicate frustration. 152 The national identity of the Suphan Buri province is 250 percent, with 62.50% in addition to the form of communication, which creates the perception of the natural frustration of the identity plant. of Suphan Buri province. The researchers have made a letter to the prime Minister, Wang Yang, Sriprachan District, Suphan Buri province to inform them that the general public would like to acknowledge communication (advertising, PR) through digital media first, that is through Internet/ Social Network. Consistent with the research of Kongkit (2007) studied the logistic analysis of the rubber trade through the Thai border to China, found that the application of SCOR Model in the process of the primary processing plant can Take the SCOR Model at the Configuration Level (Process Categories) and the Process Element Level (Decompose Process) and use the supply chain performance metrics. By gauges according to the SCOR Model that will be used to evaluate the operational efficiency of the rubber processing plants Found that the sample factory evaluated has a similar performance in each area. This is because the rubber processing process is not complicated. Because it is easy to transport this is because the procurement process must be conducted with suppliers in many ways, both the people and middlemen.

Suggestions

From the study, there are suggestions for improving the supply chain of farmers in Wang Yang, Sriprachan District, Suphan buri Province as follows;

1. Input: the matter of raw materials should support the issue of plant species that are resistant to disease and insects. The government should go into land reform in marking large plots and modern tools to reduce production costs.

2. Process: from planting process to harvesting a need to reduce chemicals to preserve the environment and create sustainability.

3. Output: it should be grouped in the form of community enterprise as a bargaining power with entrepreneurs to create value added.

4. A written a business plan is needed: Is planning cultivation worth the investment? Starting from planning and implementing the plan including monitoring and evaluation every step.

Suggestion for further research

The recommendation for further research should be improved in the supply chain of the water growers in Wang Yang, Siprachan District, Suphan Buri Province, which is as follows; 1. Production factor (Input) should support the subject of a disease-resistant and insect tolerant species. The local government should arrange the land in a large conversion and modern tools to reduce the cost in the production factor. 2. Manufacturing process

(process) from cultivation process to harvesting process should reduce the use of chemicals to preserve the environment and create sustainability. 3. The output (Output) should be a group of farmers in a community enterprise form to use as a competent authority to create value-added (Value added) 4. Writing Business plan is writing a plan for cultivation of investment. It starts from planning and includes tracking and processing in each step.

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