International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

Tomato Supply Chain and Logistics Management of an Economic Crop in Tai Ngoi Community

[1]Chadarporn Nabchid, [2]Jetrumpa Pomtasan, [3]Kanjanaporn Ninchinda

Abstract— *this research focuses on the development and participation of communities to increase their farming economic capability through the integration of efficient supply chain management and logistics management for their crop production. The key objectives of the present study were to investigate and illustrate in a model the relationship linkages in the supply chain management and logistics management of a community crop, namely tomatoes, as an important economic plant for the Tao Ngoi community. The research study used a qualitative research methodology, with data collected from a survey conducted with questionnaires and from in-depth interviews the main research tools. Data was collected from in-depth interviews with farmers and tomato processors and other stakeholders, as well as from participatory observation, with an aim to study the linkages between the supply chain representing the farmers as growers and the tomato processors and downstream actors. It was found that there had been changes in the traditional supply chain toward a new more modern format, whereby the growers exchange information with stakeholders to know the needs of the market and consumers in the country in order to better plan the production according to advance orders and demand. The study of the relationships in the tomotoes supply chain covers the suppliers of the raw materials and the merchants/buyers, who select the raw tomatoes for the factory processing according to the needs of their customers. This study aimed to help farmers deliver good quality raw materials, on time, and in a safe manner. Operations in the supply chain management were assessed using the supply chain operations reference (SCOR) model.*

Index Terms— *Supply chain, Logistic management, Economic crop, Community*

I. INTRODUCTION

A. Background

Tomatoes today are considered an important economic crop of Northeast Thailand. Farmers grow tomatoes for sale to meet consumption demands, whether it is for the consumption of fresh or processed tomatoes, such as tomato juice, crystallized tomatoes, and tomato sauce. Tomatoes have many valuable health properties. Tomatoes contain substances that can inhibit the growth of fungi. Tomatoes contain carotenoids, a natural pigment found in plants, which can be classed into 2 groups: oxygen-containing groups, such as xanthophylls, and oxygen-free groups, such as carotenes, representing approximately 90–95% of the total carotenoids. The antioxidant lycopene

[1] *Sakon nakhon Rajabhat University, nananabchid@gmail.com*

[2] *Sakon nakhon Rajabhat University, nattynoii@gmail.com*

[3] *Sakon nakhon Rajabhat University, K.ninchinda@gmail.com*

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

is one important substance in the group of carotenes found in red tomatoes, making tomatoes an important source of antioxidants that can help reduce illness from various diseases as well as a source of a substrate involved in the synthesis of vitamin A, which is good for the eye sight, and a source of vitamin C. These are some of the reasons why tomatoes are such an important food source and economic market [5].

The Agricultural and Cooperative Development Plan of Thailand was developed in accordance with the provisions of the Agricultural Economics Act BE 2522 to promote Thai agriculture. Further, this is delivered in line with the National Economic and Social Development Plan, specifically the agricultural development plan as set out in the 12th National Economic and Social Development Plan (2017–2021), which outlined 4 strategies for supporting agriculture in Thailand: 1. Strengthening farmers and farmers' institutions; 2. Increasing the efficiency of agricultural product management throughout the supply chain; 3. Increasing the competitiveness of the agricultural sector through the greater use of technology and innovation, and 4. Achieving a balanced and sustainable management of agricultural resources and the environment. Under the agricultural development plan, it is envisioned that the agricultural sector must adjust and strengthen the networks between farmers and relevant departments to ensure the sector can keep up with the changing technology and modern demands. For Thailand, the agricultural sector is considered to play a very important role in the country's economic system. Especially, as it involves a lot of people, it is the source of food for people in the country, is important for national food security, generates export revenue, and as it also provides raw materials for the industrial sector and the service sector to generate revenue for the country. It is also a way of life for many, and a source of wisdom and culture that has been passed down from generation to generation over a long time. Sustainable agricultural development is therefore considered to be at the heart of the country's economic and social development [6].

Many in the Tao Ngoi community grow tomatoes as a second job, after traditional farming their main occupation. Tomato planting was started as a royal initiative of King Bhumibol Adulyadej in order to help the farmers in Nangoy village generate extra income to support their cost of living. Following collection of the tomato yield, the farmers deliver the produce to the Royal Food Factory no 3 (Tao Ngoi) for processing to transform the tomatoes into products, which are sold under the "Doi Kham" brand. Various problems arise from changes in the economy and climate change, which affect the agricultural resource development opportunities and food security, creating challenges to effectively balance production and promote sustainable agricultural development. This includes challenges with the process of driving agricultural development plans into action and giving importance to linking local areas and the community, so that they have an understanding of the agricultural development strategy that is consistent with the local area context and so that the community more clearly can understand and use the concepts and direction of national development to achieve sustainability in accordance with the national sufficiency economy philosophy. In this philosophy, production by farmers is managed from the original sourcing of the crop to its sale destination through five management processes: planning, the procurement of raw materials, production of the crop, delivery of the produce, and the potential return of goods. This is called the supply chain and activities that occur in the supply chain are called logistics. The work of each process can add value and reduce costs by ensuring good quality products are provided to consumers.

Currently, the tomato cultivation area of Tao Ngoi community is considered an important economic area of tomato cultivation in Sakon Nakhon and Northeast Thailand. This article presents a study of the supply chain management and logistics management of tomatoes, which is an important economic plant for the community, with

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

an aim to strengthen the local economy and to implement a system to make the crop production more competitive. This can build increasing knowledge and understanding and can help increase the economic value of this production. There are guidelines for community management regarding the supply chain management and sustainable logistics management for communities in line with the national development plan.

B. Objective

1) To study and demonstrate the links between the supply chain management and logistics management of an important economic crop, namely plant tomatoes, by Tai Ngoi community.

C. Research scope

This research studied the system in place and shows the linkages between the supply chain management and logistics management of tomatoes, as an economic crop of Tao Ngoi community. The aim of the research was to find an efficient model for a structured connection of the supply chain management and logistics management that would be most appropriate and effective for supporting the community to maximize the economic benefit from its tomatoes production.

II. METHODS

A. Population and sample group

The study population and sample groups used in this research were tomato growers in seven villages in Tao Ngoi Subdistrict, Sakon Nakhon Province, Thailand. The sample group included the middlemen who sell tomatoes, and the processors at the royal factories and commercial establishments.

B. Search tools

The main data collection tool was the use of questionnaires to collect data from the farmers' sample group, which was further split into the following sub-sample groups: tomato producers, tomato suppliers, processed tomato producers, and tomato suppliers

C. Designing tools

The sample number was calculated according to the stratified sampling principle, dividing the groups of housewives and community enterprise groups into the strata, with each homogeneous stratum having layers. These were then split into small and medium sizes, then each sample size was calculated according to the formula of Krejcie and Morgan (R.V. Krejcie & D.W. Morgan), together with using a specific sampling method to make a sample of the number of housewives and community enterprises.

D. Data collection

The data collection was split into three steps as follows.

The population and sample group used in this research comprised tomato growers in Tao Ngoi Subdistrict, covering seven villages in Tao Ngoi District, Sakon Nakhon Province. The sample group also included the

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

middlemen who sell the tomatoes, the royal factories that process the tomatoes, and other stakeholders. This survey used the principle of "stratified sampling," by dividing the number of households that cultivate tomatoes into "strata," specifically seven layers. In this research, the researcher divided the sample by village, with each of the seven villages, or landscapes, having a homogeneous stratum in order to reduce errors in the calculation of the sample size.

Step one, the number of samples represented the number of people who supply tomatoes, consisting of middlemen, farmers, and the central markets from the samples of the seven selected villages.

Step two, the sample number was calculated according to the stratified sampling principle, dividing the groups of housewives and community enterprise groups into the strata, with each homogeneous stratum having layers. These were then split into small and medium sizes, then each sample size was calculated according to the formula of Krejcie and Morgan (R.V. Krejcie & D.W. Morgan), together with using a specific sampling method to make a sample of the number of housewives and community enterprises.

Step three, tomato supplier groups were set up using the number of samples from the number of middlemen, royal factories, and all the farmers who buy tomato products from the Tao Ngoi community.

E. Data analysis

The introduction of a SCOR model and Activity Based Costing (ABC) logistics cost analysis helped develop a model to measure the effectiveness of the tomato supply chain. Starting at the source meant taking a group of tomato producers, followed by the tomato supplier group, then the group involved in the processing of the tomatoes, finally to the group active at the product destination.

III. RESULTS OF DATA ANALYSIS

The main data collection tool was the use of questionnaires to collect data from the farmers' sample group, which was further split into the following sub-sample groups: tomato producers, tomato suppliers, processed tomato producers, and tomato suppliers. The SCOR model and activity based costing (ABC) logistics cost analysis were utilized to help develop models to measure the efficiency of the supply chain, with the following performance results.

A. Part one

The tomato producer groups performed measurements of the quality, cost, and time. It was found that most farmers grew tomatoes according to the demand time specified by the royal plant, with the planting time covering 5 models. The first model begins with planting seeds from October to November and the harvesting time is then approximately 1 month for tomato production. After 5–7 days, the seeds for the next crop are planted. The total time of planting and harvesting for each model takes approximately 90 days. Farmers prefer to sell around 15% of their fresh tomatoes. This is because there is no space for storing the tomatoes and they like to use the money raised to pay off debts, with this element having a logistics cost of approximately 2.25 baht / kilogram. This covers the cost of procurement-procurement at 0.05 baht / kg, which is mainly related to the cost of procuring fertilizer and seedlings, and the cost of moving the tomatoes, which is about 2 baht / kilogram. A major part of

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

the production costs are for wages for harvesting the tomatoes and transportation costs of 0.25 baht / kg. Most of the farmers pack tomatoes in plastic baskets and then use stacks (plows) or pick-up trucks to distribute these to the important places, such as the royal factory, at a distance of around 10 kilometers, which takes about 30 minutes, and to the middlemen, respectively.

B. Part two

The suppliers group was divided into 3 sub-groups:

Most middlemen have their own truck or pick-up truck. They use a truck to collect the tomatoes from the farmer's farm. Here, the tomatoes have a moisture content of more than 15% with a cost of procurement-procurement of 0.25 baht per kilogram. Most of the distance for the collection point to the farmland of the farmers is less than 10 kilometers. The transportation time is approximately 30 minutes per trip. The cost of moving the tomatoes costs 0.05 baht per kilogram and the logistics costs are 0.002 baht per kilogram. This is the cost of communicating with farmers, packing the tomatoes into baskets or plastic crates, then using a car to transport the tomatoes from the stacker collection point (tractor) or pick-up truck to the royal factory or the use of a ten-wheel truck to deliver the tomatoes to the central market. This incurs a transportation cost of 0.05 baht per kilogram, and the transportation time is approximately 60 minutes per trip. Most middlemen like to sell directly to the royal factory within the Tao Ngoi district as sending to a factory in a nearby province, such as the Si Chiang Mai Industrial Factory or Rosa Industries Limited in Nong Khai province, takes about 5 hours per trip. So most middlemen prefer to sell tomatoes to the royal factory because the distance of transportation is not more than 20 kilometers. The cost of logistics communication is 0.0002 baht per kilogram, which is the cost of contacting the royal factory.

The cost of procurement for farmers groups is 0.010 baht per kilogram. This is the cost of purchasing – procuring seedlings, such as the cost of checking the quality of the seedlings by obtaining seeds and seedlings with more than 15% moisture. After that, the farmer will convey the tomatoes to be transported then distribute them to the royal factory, which results in a cost of moving them of 0.070 baht per kilogram and transportation costs to the royal factory to distribute them at 0.10 baht per kilogram. The transportation time is approximately 20 minutes.

Central market, it was found that farmers sell tomatoes with more than 15% moisture to the central market. Farmers (where the seller is the payer) have a purchasing cost – procurement of 0.012 baht per kilogram. The middleman (where buyers have to pay) charges 0.005 baht per kilogram as a service fee for the central market that the seller and tomato buyers have to pay, covering e.g., tomato quality inspection fees and for use of the tomato weighing scale, while farmers pay for the cost of moving tomatoes at 0.060 baht per kilogram. The middleman also charges 0.070 baht per kilogram as a service fee for the central market that the seller and tomato buyers have to pay to cover items like the transport cost and to unload the tomatoes off the truck.

C. Part three

The groups for processing tomatoes can be divided into two groups:

Royal factory, Instant Food no 3 (Tao Ngoi), which buys tomatoes from the farmers by determining the purchase price at approximately 2.50–3.00 baht per kilogram. The operating costs on the orders is 0.50 baht per kilogram and procurement-procurement costs are 0.35 baht per kilogram. After that, the factory will convey the

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

tomatoes to the tomato resting point and put them into the production process, and also does tomato juice quality inspection, packing, labeling, and packaging. This process usually uses trucks for transport at 0.75 baht per kilogram. It takes about 8 hours for the goods to be distributed to Bangkok, while the distance to other royal factories takes 1–2 days.

Tomato Growing Community Enterprise: This has operational characteristics similar to the Royal Factory, Instant Food no 3 (Tao Ngoi). The Tomato Growing Community Enterprise group will buy tomatoes from farmers, at the purchase price at 3.00 baht per kilogram. The operating costs are determined according to the order size but around 0.67 baht per kilogram and the purchasing cost – procurement is 0.35 baht per kilogram. After that, the tomatoes will be picked and stored in the storehouse, and prepared for processing, whether to make soap, dishwashing liquid, or crystallized tomatoes, and to then undergo packing, labelling, and packaging. This process uses cars or public transport and incurs transportation costs of 0.75 baht per kilogram. It takes approximately 6–7 hours to transport goods to Bangkok, while the distance to other royal factories takes 1–2 days.

D. Part four

Tomato suppliers are divided into 2 sub-groups:

Yong. It was found that Yong was contracted to buy and sell tomatoes between farmers and middlemen. This results in a cost for logistics communication of 0.015 baht / kg.

Wholesalers / retailers. It was found that the wholesalers come to pick up the tomatoes that are bought from farmers or from community enterprise groups or by contract through Yong to pack around 20 kilograms per carton. After that, the products are distributed through 2 channels, which are traditional channels, such as Yi Pua, Pua Pao, and Sucker chains. At present, there is a market testing to develop new trade channels, by dividing one channel into 2 news channels. The farmers group cooperates with community enterprise groups selling tomatoes at trade shows, such as Muang Thong Thani, or by traveling around Thailand, e.g., to Lumphini Park or for trade shows in department stores. The second way is to bring tomatoes to share transport. The truck contains 1–2 tons of tomatoes that are transported to retailers in the districts and nearby provinces, taking 2–3 hours to transport, on average, for a transport cost of 0.30 baht / kg. For storing tomatoes in the warehouse, this involves storing tomatoes in crates and putting them in a warehouse with air and cleanliness management. Some wholesale retailers store in a cold room, with controlled temperature, and so can store tomatoes for a period of around 1–2 months, with the cost of warehouse management and storage being 0.050 baht / kg.

Data collection was performed using questionnaires filled in by the farmers sample groups as above, and then the data was analyzed according to the study objectives. The beginning of the tomato supply chain has changed from the traditional supply chain to a new form of tomato sales as follows.

The traditional cultivation focuses on the needs of farmers (Supply Focus), where farmers plant seeds without knowing the needs of the market, such as how much is needed. In most cases, the crop will exceed the demand (oversupply), therefore the famers cannot determine the best selling price as there is an oversupply. The new cultivation system emphasizes a demand focus, where the supply is produced according to market demand or the needs of the planned product collectors. In the traditional market structure, there is high competition from both middlemen and wholesalers. In the new model, there will be a futures trading plan between the buyer (middleman)

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

and farmers, which will determine the quantity and quality as well as the price. The cause of change is the growth of the market and the increasing use of information technology providing access to demand information driven by the market mechanism. The factory needs raw material planning (fresh tomatoes) in the long term. Therefore, it is a must to have the compiler (middlemen) find enough raw materials as planned (according to the customers' orders). The tomato collectors have to sign contracts in advance with farmers. This allows farmers to grow an amount agreed with the tomato collectors each year in order to get the agreed quantity delivered to the factory. Therefore, there is a systematic plan for every activity in the supply chain. At the beginning is a forecast of plant demand, so the product collector and tomato growers know. Once the farmers know the amount and needs of the product collector, it requires planning since inputs factors need to be considered, such as do they have enough land or not. If not enough, they have to rent more, but how much more? Also, is there enough labor? If not, they need to find more labor from anywhere. Do they have sufficient funds? If not enough, where to find funding sources. Including for the tools and equipment used for the process of production. Is the water sufficient or not? Is the fertilizer that is used for the final maintenance and the output sufficient as signed in advance with the product collector or not. If not, following the risk management plan, what should be done?

On the supply chain management of farmers after the farmers have received orders from the producers, the farmers will start producing tomatoes, and when getting the products, each farmer will harvest the products. The product is then collected to send to the product collector in order for them to select the quality and quantity before sending it to the customer.

After the product has been collected, the product is delivered to the factories / operators and from there delivered to the customer. In terms of the relationships in the tomato supply chain in each period, it can be seen that in each chain, a connection can be seen from studying the linkage of tomato supply chain management between farmers groups and the product collector to the entrepreneur / tomato processor, in Tao Ngoi Subdistrict, Tao Ngoi District, Sakon Nakhon Province. The results found that the main factors as model inputs were:

Farmer factors, where most of them have their own area for growing tomatoes, and they have experience in growing tomatoes, and outstanding professional skills in this area.

Raw material factors, taking in to account the production, the tomato varieties grown, the soil condition, and the surrounding environment.

Investment factors, whereby most of the farmers do not have their own investments, and rely on the income that has been accumulated from previous products, but if some of these funds are insufficient to borrow outside, they will only gather tomatoes for the collector. Farmers then begin to produce tomatoes and store tomato products at high interest rates. Only a few of those who meet the criteria are able to borrow from the Bank for Agriculture and Agricultural Cooperatives (BAAC), which are government financial institutions that can help in certain cases.

Tools factors, including production machinery, and the tools used for general agriculture activity, such as shovels, spades, pumps, lawn mowers, sprayers, tractors. Regarding the machinery, as seen, there are cars that are used for supporting the planting of the seedlings. As for the harvesting process, only labor is needed.

Management factors in production, where farmers may have better management plans and are skilled in changing the planting and harvesting times to suit the climate.

In the process of planting, tomato plots must be tended all the time after planting seedlings after 7 days. After 1 month, the farmer must start spraying to protect crops from insects and mold, doing this for 10 days at a time for 1

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

month. At the end of 2 months, fertilizer formulas need to be applied. The farmer also starts spraying to kill mold and insects and adds hormones every 7 days, spraying continuously for 5 months. Three months after planting, the famer applies fertilize for 15–20 days at a time for 3 months. From the beginning of planting, till 5–6 months after planting, the farmer can begin to harvest the produce.

In terms of output, the tomatoes that can be harvested will be 5–6 months old. If more than this, they will begin to rot, and the yield will decrease. The harvesting is performed by picking from the tree, utilizing manual workers to collect the tomatoes. Wages will be around 300 baht per day depending on the size of the planting area. After that, a middleman will buy the produce according to the quantity, quality, and price that has been contracted in advance.

In the field study, the purpose was to work together with the group of product collectors to help design a new supply chain covering all the production activities: starting from the origin to the destination and covering all the internal operations of the supply chain in between, up to receiving orders from customers back to the tomato growers.

A study of the joint operations with a group of product collectors led to the proposal for the new supply chain model covering all the production activities, from upstream to downstream, and all the internal operations of the supply chain, as shown in Figure 1.3. Here, when the customer makes an order, the recipient of the purchase order will send the order to the product collector. The product collector will then find a group of farmers to produce the required product according to the purchase order. Farmers can then plan the production to produce the product according to the needs of the product collector.

For stakeholders operating within the supply chain, starting from customers / entrepreneurs, there is a need to issue a purchase order and issue orders to the middlemen / product collectors. The collector of the product is then sent to the tomato collector and the collected tomatoes sold according to the customer's purchase order. However, the compiler may need to contact many farmers to get the quantity desired according to customer order. When the product collector has made advance agreements (assigning production) to farmers, the farmers must perform production planning covering from planting to harvest. Farmers produce the tomatoes to the agreed standards and quantities. Here, it may be seen that this stakeholder is still lacking a supplier, which is an important key.

But this will explain that the delivery is a flow of information that starts from the purchase order from the customer to the order recipient, and encompassing production planning, the collector, product, farmer, tomato, workers harvesting products, selling, sending an order, assigning production, harvesting, planting, ordering recipient, production planning, product, collector, and farmer. These are considered as the whole cycle of the supply chain and logistics activities included by this researcher to analyze the supply chain management data using the SCOR model

IV. CONCLUSION

A study of the supply chain and logistics management of tomato crops in Tao Ngoi Community, Tao Ngoi District, Sakon Nakhon Province, using the SCOR model was performed and showed the connections and relationships in the supply chain between the farmers and those who gather the products (the middlemen) to the tomato processors, as well as the relationship between the tomato supply chain and the supply of raw materials,

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

middlemen, wholesalers, and retailers of the royal factory, who collect raw tomatoes to send to the factory, in order to have good quality raw material delivery. The quantity of goods delivered needs to be accurate, punctual, and safe. Although the use of the SCOR model here refers to the implementation of a supply chain for tomatoes as a management tool, it demonstrates the value of the systematic planning of related processes from the level of their origin to the middle processing and on to their final destination, which can help improve the efficiency of the supply chain. To use the SCOR model to support farmers in Tao Ngoi Subdistrict, Tao Ngoi District, Sakon Nakhon Province, to grow tomatoes and achieve success depends on many important factors, such as risk management, the ability to make decisions and solve problems, and the discipline of the farmers groups, and this process must start from farmers, and include suppliers, operators, and carriers, whose activities must be adjusted for growth and to meet consumers needs.

V. RECOMMENDATIONS

To make the work cycle that covers from the planning, procurement, storage, and moving more efficient, improvements in the logistics management and tomato supply chain for Tao Ngoi economic plants can be designed using an operational model developed according to the SCOR Model. Here, it is clear farmers need to reduce the cost from the beginning, starting with the cultivation, to the product moving, storage, and maintenance in a systematic way, as well as improving inventory management, reducing costs in procurement, and by joining groups, such as establishing community enterprises to reduce the middlemen and transportation problems.

REFERENCES

1. Arjan J. Van Weele, 2005, Purchasing & Supply Chain Management: Analysis, Strategy, Planning and Practice, 4th ed., Thomson, London, pp. 12, 251–252.
2. Gul Esin Delipinar and Batuhan Kocaoglu , 2016 , Using SCOR model to gain a competitive advantage: A Literature review , Procedia - Social and Behavioral Sciences 229 (2016) 398–406.
3. Michiel R. Leenders, P. Fraser Johnson, Anna E. Flynn and Harold E. Fearon, 2006, Purchasing and Supply Management with 50 Supply Chain Cases, 13th ed., McGraw-Hill, Singapore, pp. 4–5, 61–62.
4. Robert Monczka, Robert Trent and Robert Handfield, 2002, Purchasing and Supply Chain Management, 2nd ed., South-Western, Mason, p. 22.
5. Saowanee Ketsakul , 2015 , Tomato Production Technology , Department of Agriculture.
6. Thanyathon Tinnaphop , 2016 , SUPPLY CHAIN MANAGEMENT BY COMMUNITY ENTERPRISE PRODUCING ORGANIC RICE IN THE CENTRAL REGION OF THAILAND, VRU Research and Development Journal Humanities and Social Science , Vol 14 No 2 (2016):319–330.
7. Vogt J, Pienaar WJ, de Wit PWC. Business Logistics Management: Theory and Practice. 2nd ed. Oxford University Press; 2005.
8. Yasameen Al-Majedy, Ahmed Al-Amiery, Abdul Amir Kadhum, Abu BakarMohamad. "Antioxidant Activity of Coumarins." Systematic Reviews in Pharmacy 8.1 (2017), 24-30. Print. doi:10.5530/srp.2017.1.6
9. Meng, L., Qi, J.The effect of an emotional intelligence intervention on reducing stress and improving communication skills of nursing students(2018) NeuroQuantology, 16 (1), pp. 37-42.
10. Song, D.Semantics of information(2017) NeuroQuantology, 15 (4), pp. 88-92.

DOI: 10.37200/IJPR/V24I4/PR201030
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020