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# **Competitiveness of Local Agriculture: the Case of Longan Fruit Trade between China and the North of Thailand**

Narat Hasachoo and Phattaraporn Kalaya

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IRASEC (USR CNRS 3142 - UMIFRE 22)  
c/o French Embassy  
29 Sathorn Tai Road  
Bangkok 10120  
Thailand

Tel : (66) 026 77 31 91

Fax : (66) 026 77 31 96

Website: [www.irasec.com](http://www.irasec.com)

Email: [publications@irasec.com](mailto:publications@irasec.com)

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# Competitiveness of Local Agriculture: the Case of Longan Fruit Trade between China and the North of Thailand

Narat Hasachoo<sup>1</sup> and Phattaraporn Kalaya<sup>2</sup>

## Abstract

At the present time, policymakers are trying to add barriers, other than tariffs, to international trade. These are commonly known as Non-Tariff Measures or NTMs. For example, there are Good Agricultural Practices (GAP) codes, standards, and regulations that affect the exportation of agricultural products. Longan is a politically and economically sensitive fruit that grows mainly in the North of Thailand. Longan production completely depends on China because that country represents more than 80 percent of Thailand's export market. If there are any NTMs that might obstruct the exportation of Thai longans to China, they will surely affect Thai farmers, especially the ones located in the northern part of Thailand, where 172,229 households grow longans. One of the methods that can be used to analyze the entire agricultural system is supply chain analysis. This research will study and analyze the effects of NTMs on the local longan supply chain in the northern part of Thailand, from growers to distributors, focusing on the supply chain that trades with China through the Greater Mekong Subregion or GMS. Purposive sampling was applied to choose Pa Daet District as a case study, and then followed by snowball sampling to

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<sup>1</sup> Narat Hasachoo is a full time lecturer in the Aviation Business Management Program, School of Management, Mae Fah Luang University, Chiang Rai, Thailand.

<sup>2</sup> Phattaraporn Kalaya is a full time lecturer in the Logistics and Supply Chain Management Program, School of Management, Mae Fah Luang University, Chiang Rai, Thailand.

choose the players involved in the chain as a sample. A major focus of the study is the analysis of the current NTMs on each player and their economic impact on each player in the supply chain. The other part is identification of local supply chain current coping strategies. One of the main outcomes is to understand and be able to analyze the economic impact on stakeholders in the supply chain if NTMs obstruct or even stop the longan trade with China.

## Introduction

Longan or *Dimocarpus longan lour* is a tropical fruit tree that is generally grown in the northern part of Thailand, especially in the upper provinces of the northern region. The longan tree originates from Guang Dong, Guang Xi, Si Chuan, and Fu Jian provinces in Southern China. In 1798, the longan was introduced in India, and it came to be commonly grown in former Indochina (Thailand, Cambodia, Laos, and Vietnam) and in Taiwan.<sup>3</sup> Longan is also nicknamed the "dragon's eye" by Chinese people because of the characteristic white eye-shaped mark on the pit. It can be eaten alone or in salad. Longans are demanded in various forms, such as fresh, dried, or frozen.

Longan is a politically and economically sensitive fruit. It is Thailand's second-most exported fruit in terms of value after pineapple and is ranked third in terms of fruit values after durian and pineapple: 13.9 percent, 34.49 percent, and 28.89 percent respectively. Longan's export value was 4.87 billion baht in 2007 and made up 13.9 percent of Thailand's total fruit revenues, and provided a 0.4 percent share of the country's agricultural export in 2007. It is exported and consumed primarily as a fresh or dried product. In 2009, Thailand exported all types of longans to the international market; the volume was 298,600 tons worth 6.059 billion baht per year.<sup>4</sup> China is the main international market; in 2010, 80.86 percent of dried longans produced in Thailand, and 42.71 percent of fresh longans produced in Thailand were exported to China.<sup>5</sup>

Thailand's major production area for longans is located in the northern region; in 2011, Thailand produced in total 777,099 tons of longans, 593,439 tons of which came from the country's northern provinces.<sup>6</sup> There are 172,229 households involved in the longan industry in the northern region, with 154,835.52 hectares of plantation area.<sup>7</sup>

Chiang Rai, Thailand's northernmost province, is bordered by two countries: Laos People's Democratic Republic or Laos PDR, and the Republic of the Union of Myanmar or Myanmar. Chiang Rai also has two international roads that connect Thailand to China, R3W and R3E, which represent a total distance of 916 kilometers under the GMS.

In 2011, there were 29,521 households in Chiang Rai involved in the longan industry, producing 48,693 tons of longan on a total plantation area of more than 19,428.80 hectares.<sup>8</sup>

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<sup>3</sup> Julia Morton, "Longan," in *Fruits of warm climates* (Miami, FL., 1987), 259–262. Accessed May 24, 2012, <http://www.hort.purdue.edu/newcrop/morton/longan.html>.

<sup>4</sup> "Longan trading situation," Department of Foreign Trade, 2011, <http://www.dft.go.th>.

<sup>5</sup> Office of Agricultural Economics, <http://www.oae.go.th/>.

<sup>6</sup> Office of Agricultural Economics, 2011, [http://www.oae.go.th/download/fruitData/Comparison Longan 55-North.html](http://www.oae.go.th/download/fruitData/Comparison%20Longan%2055-North.html).

<sup>7</sup> Office of Agricultural Extension and Development Region 6, 2011, [http://www.ndoae.com/Data\\_plant/Data\\_all2012/D\\_longan54.pdf](http://www.ndoae.com/Data_plant/Data_all2012/D_longan54.pdf).

<sup>8</sup> Office of Agricultural Extension and Development Region 6, 2011, [http://www.ndoae.com/Data\\_plant/Data\\_all2012/D\\_longan54.pdf](http://www.ndoae.com/Data_plant/Data_all2012/D_longan54.pdf).

Area	Plantation (hectares)	Yield (tons)	Households
Thailand	154,835.52	772,099	N/A
Northern	136,442.40	593,439	172,229
Chiang Rai	19,428.8	48,693	29,521

**Figure 1. Longan Production in Thailand (2011)**

From fig.1, it can be seen that 77 percent of Thai longans were produced in the northern region, and 88 percent of the plantation area is located in the North. Chiang Rai is the direct gateway to export longans to China and the province produces around 8 percent of the northern region's total longan yield.

Yu<sup>9</sup> states that a supply chain consists of at least three players, namely the supplier, the manufacturer, and the customer. It is more complicated when the supply chain is extended in the real world. There will be wholesalers, traders, distributors, and even service providers involved in the chain. So the longan supply chain, from upstream to downstream, will include many players, from Thai growers to Chinese importers. This means that even a small change could affect all the players in the supply chain. It thus becomes much more interesting to understand the economic impact of barriers to international trade on those players, especially among countries where tariffs are almost equal to zero.

NTMs are now sometimes used as barriers. "Since there is an increasing interest among policymakers in addressing barriers to trade other than tariffs, known collectively as 'Non-Tariff Measures' or NTMs. As tariffs have declined steadily since the 1940s, both in seven GATT/WTO rounds and in numerous unilateral, bilateral, and plurilateral liberalizations, government interventions to restrict imports have increasingly taken non-tariff forms. These include, but are not limited to, quantitative restrictions, technical barriers to trade, sanitary and phytosanitary measures, price-based measures, and so on."<sup>10</sup>

As mentioned earlier, Thai longans are truly dependent on China since 80.86 percent of dried longans and 43.71 percent of fresh longans are exported to China. So it is interesting to understand what would happen to Thai players in the longan supply chain if they had to face barriers that might reduce or obstruct their export capabilities; especially those players in Chiang Rai who are located at the export gateway to China.

On February 26, 2003, China banned all Thai longans from entering China, citing excessive toxic residues as a reason, causing confusion and problems for Thai growers. At the same time, the Thai domestic prices dropped since most longans were only produced for export to China.<sup>11</sup>

The selected area as a case study for this research was Pa Daet District since, in 2010, it was the second-largest yielding area in the province of Chiang Rai, following Phan District, with over 2,615 growers.<sup>12</sup> Although the largest yielding area was Phan District, its longan cooperative no longer exists because its members objected to lack of transparency in the director's management practices.<sup>13</sup> So the seven players involved in Pa Daet District were selected by using snowball sampling for this research, followed by the analysis of the economic impact on each player if possible NTMs on the longan trade with China were to be imposed and enforced, and whether or not those players would be ready to handle the future with NTMs.

<sup>9</sup> Yu Li, "Analytical Input-Output and Supply Chain Study of China's Coke and Steel Sectors," Master's Thesis (S.M.), Massachusetts Institute of Technology, Dept. of Urban Studies and Planning, Cambridge, MA, 2004.

<sup>10</sup> Michael Ferrantino, "Using Supply Chain Analysis to Examine the Costs of Non-Tariff Measures (NTMs) and the Benefits of Trade Facilitation," staff working paper ERSD-2012-02, World Trade Organization, 2012.

<sup>11</sup> Julawadee Worasakyothin and Vilailuk Tiranutti, "Non-tariff Measures in China: Cases of Thailand-China Fruit Trade and CCC Mark Requirements on Industrial Products," the International Institute for Trade and Development (ITD), 2007.

<sup>12</sup> Agricultural Research Development Agency, <http://www.arda.go.th>.

<sup>13</sup> *Matichon Online*, June 10, 2010, [http://www.matichon.co.th/news\\_detail.php?newsid=1244636393&catid=05](http://www.matichon.co.th/news_detail.php?newsid=1244636393&catid=05).

# 1. The current longan supply chain in the North of Thailand

Cooper and Ellram<sup>14</sup> defined supply chain management in terms of the analysis and management of the entire network, from the supplier through to the ultimate customer, with a view to achieving the best outcome for the whole system, while Lambert et al.<sup>15</sup> defined it as an integration of the key business processes from end users through to the original suppliers.

As mentioned above, the supply chain consists of at least three players—the supplier, the manufacturer, and the customer—and four flows—Physical, Information, Money, and Reverse<sup>16</sup>.

In this research, we will analyze the players, three of the four flows (physical, information, and money), and collaboration among the players in the longan supply chain in order to understand their relationships and how they manage to work together.

## 1.1. How many people are involved in the chain?

Pa Daet Cooperative was selected as a case study by using purposive sampling, since they are the largest group of longan growers in Pa Daet District. Then, snowball sampling was applied by selecting the players involved in the supply chain. We found that there are seven players involved in the supply chain to export Chiang Rai longans to China: **growers, longan cooperatives, private consolidators, local dried manufacturers, foreign dried manufacturers, importers, and logistics service providers (LSP)**, as can be seen in the figure below (fig. 2). We then used in-depth interviews with semi-structured interview questions on each sample.

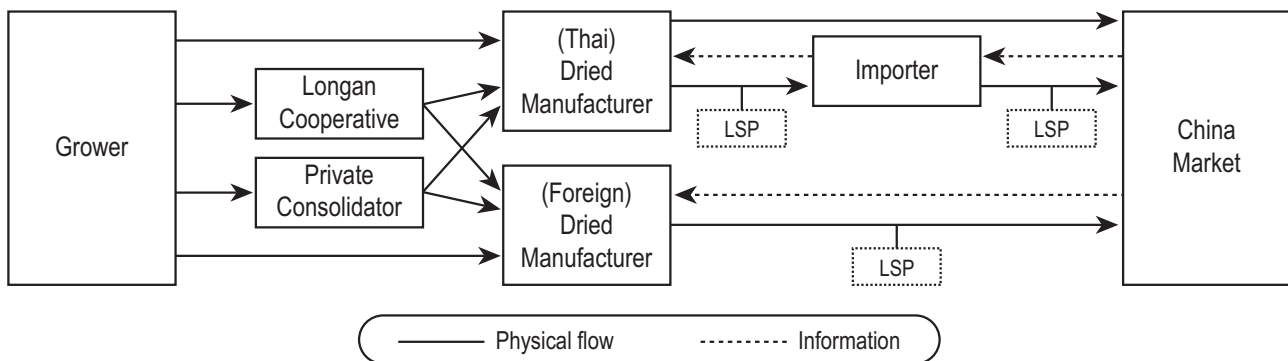


Figure 2. The supply chain for exporting dried longans in Chiang Rai (from survey)

<sup>14</sup> M.C. Cooper and L.M. Ellram, "Characteristics of Supply Chain Management and the Implications for Purchasing and Logistics Strategy," *International Journal of Logistics Management* 4, issue 2 (1993): 13-24.

<sup>15</sup> D. Lambert, M. Cooper, and J. Pagh, J, "Supply chain management: implementation issues and research opportunities," *International Journal of Logistics Management* 9, issue 2 (1998): 1-19.

<sup>16</sup> Reverse flows deal with the management of rejected products, for instance the choice of returning or destroying longans that are rejected in China.

## 1.2. Flow and collaboration in the longan supply chain

This research will start with explanations of the flow and collaboration in the supply chain between each player. It is very important to understand the players' actions and their roles in the process of exporting longan to China before we can understand the barriers they are now facing. We will also study the reasons that force them make decisions like the ones they currently act upon. Then, in addition to understanding their actions in the supply chain, we will try to understand more about their exposure to the risk of the NTMs on the longan trade with China.

### 1.2.1. Growers

In this research, the term growers refers to members of Pa Daet Longan Cooperative who grow longans for export and/or for domestic trade. The research showed that there are four channels currently available for growers to distribute their produce: via longan cooperatives, via private consolidators, direct trade to the Thai dried manufacturers, and direct trade to the foreign dried manufacturers. Note that all growers are asked to sort their longans by size before transferring to or trading with these four channels.

A grower explained, "We have four main channels for selling or distributing our longans: through our cooperative, through private consolidator, direct trade with local dried manufacturer, and direct trade with the foreign dried manufacturer."<sup>17</sup>

Growers cannot identify the importer with which they are trading, or the market to which their longans are being exported. This is because most of the growers are now under the "push system", which means that they try to push their supply (longans) to meet demand. They try to maximize their area usage by growing as much as they can with no information from the demand side. We found that it was not their fault because no one has ever told them that they were growing too much. The only information they have received during this decade is that Chinese importers are willing to buy all their crops because there are more than a billion people in China.

A grower summed up by saying, "I don't know which country that my longans are being exported to since they told me nothing but the price. As long as I have fresh longans, they are always willing to purchase all. That's all I know."<sup>18</sup>

#### Via longan cooperative

##### *Information and money flow*

Selling longans directly to the cooperative is one of the easiest and most effective channels for growers because most of the growers in Thailand are registered as members of one of the cooperatives in their area. All they have to do is transport their longans to the cooperative and negotiate the price. We found that the price offered by the cooperative is a little higher than the market price.

"Most of the cooperatives offer a price to its members at a little higher level than the market price."<sup>19</sup>

The concept of an agricultural cooperative in Thailand was first introduced in 1916. Growers had to estimate their yield each year and inform the cooperative; once the cooperative received an order from an importer, it allocated the quota per member, appointed the time and date for trade, and finally paid the growers with cash after the longans had been transferred.

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<sup>17</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>18</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>19</sup> Mr. Boonsong Boonpeng, vice president and member (grower) of Pa Daet Longan Cooperative, interview with author, Chiang Rai, June 2012.

The research found that most of the growers could not sell their longans directly to the market because the domestic consumption in Thailand is very low, and the longans are perishable. Together, these reasons lead growers to sell directly to the cooperative. Otherwise, they would get a lower price or even would be unable to sell their longans.

As a grower said, "Once the longans are cut down from the trees, I have to sell them as fast as I can. This is because of the freshness of the longans. It is one of the indicators for negotiating the price."<sup>20</sup>

"Sometimes I cannot set any contract with any importer but my longans are already cut down from the trees, and I cannot wait any longer. The cooperative once again helped me by purchasing my longans at a satisfactory price."<sup>21</sup>

#### *Physical flow*

Growers are responsible for transporting their longans to the consolidation center at the cooperative, using their own trucks or perhaps outsourcing this activity to an LSP or logistics service provider, who may be a person in their village.

The main problem that growers face in this process is an insufficient number of workers during the harvesting period since most of the workers with the necessary skills also have to take care of their own gardens. But growers cannot wait too long to harvest because the fruit will then fall from the trees, which will affect the price. So growers have to hire unskilled workers at a very high wage.

"During the harvesting period, I cannot find any workers who know how to handle longans to come help me harvest in my garden, as most of them are also owners of longan gardens."<sup>22</sup>

#### Via private consolidator

##### *Information and money flow*

If growers find that the price offered by the cooperative is too low, they sometimes turn their backs on the cooperative and go to trade with private consolidators, who may be either Thai or foreign. Such action is influenced by the fact that longans are the only source of income for most of the members of the Pa Daet District cooperative. Anything that would enable them to increase their only source of income each year surely interests them.

The cooperative vice president is sympathetic. "I do understand the ones who sell their longans to other private consolidators. We cannot offer them a price as high as private consolidators can. It's their only income for the whole year. So they have every right to select their offer."<sup>23</sup>

We also found out that the quota that the cooperative grants to its members, e.g., 10 tons per member, influences growers' decision to trade with private consolidators since any production in excess of the granted quota could be sold to private consolidators.

A grower explained, "I wish that I could sell the whole longan crop to the cooperative because it's somehow easier for me to get the money. But as you see, we can only sell not more than the quota granted from the cooperative. I have to sell the rest of my crop to others who would love to purchase my longans."<sup>24</sup>

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<sup>20</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>21</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>22</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>23</sup> Mr. Boonsong Boonpeng, vice president and member (grower) of Pa Daet Longan Cooperative, interview with author, Chiang Rai, June 2012.

<sup>24</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.



*Physical flow*

Some private consolidators collect the longans from each grower in the longan fields, whereas some private consolidators ask the growers to transport the crops by themselves, offering to pay the transportation cost. This strategy is very successful and very attractive since the growers do not have to bear the transportation cost.

Direct trade to Thai and/or foreign dried manufacturer

*Information and money flow*

In addition to selling longans either to the cooperative or to a private consolidator, some growers decide to directly sell their longans to the local dried longan manufacturer (which may be owned by either a Thai or a foreigner). As a matter of fact, the price offered by these manufacturers is always shown in front of the factory, and can sometimes be higher than in other channels since middlemen are cut out.

Even though it seems like this channel offers the growers the highest price, this research found that the growers had to bear many opportunity costs. They have to wait in a queue to sell their products without any guarantee that their longans will pass the quality check, or that the manufacturer has not already reached its production capacity. The longer the growers wait, the lower the product quality will be.

A grower complained, "After being in the queue for half a day, the manufacturer announced that there was a change in the market price. So they just announced a new price which was not different from the cooperative. So I drove 50 kilometers and spent half of the day for nothing."<sup>25</sup>

*Physical flow*

Any grower who would like to trade is only required to bring his longans to the factory, to enter the sorting process, and to finish the trade by accepting the price announced in front of the factory.

**1.2.2. Longan cooperative**

The agricultural cooperatives in Thailand are non-profit organizations. One of their main objectives is to help the growers distribute their products. As with others, the main goal of Pa Daet Longan Cooperative is to help its members distribute their longans, especially in the peak period (August – September) when most members do not have enough technology to store their fresh longans without losing quality. Without this help, the growers would need to sell their longans at a price that could not even cover their growing cost since the longan is a perishable product. Growers will get nothing if they wait until their longans become too ripe.

*Information and money flow*

Pa Daet Longan Cooperative currently has 946 members, and each membership is, on average, composed of two persons. The vice president showed us some interesting information about the members, stating that 95 percent of the members grow only longans in their gardens and, of course, that it is their sole source of income for the whole year.

"Ninety-five percent of my members grow only longans in their gardens, and that's why sometimes we are the only source of their income for the whole year. The average income for my members is around 70,000 Thai baht per year."<sup>26</sup>

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<sup>25</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, September 2012.

<sup>26</sup> Mr. Boonsong Boonpeng, vice president and members (grower) of Pa Daet Longan Cooperative, interview with author, Chiang Rai, June 2012.

So the growers' income is very vulnerable because they are truly dependent on the longan. These growers yield for the cooperative an average of 10,000 tons of fresh longans per year. Pa Daet Longan Cooperative cannot purchase the entire longan crop from its members because it does not have its own drying factory; it can only offer a quota in terms of baskets per member. The cost to invest in a drying factory is too high for the cooperative. Also the use of Chinese language as a trading medium is a barrier for them.

The research showed that the cooperative is also very sensitive to any change since it is the main or only channel for growers to sell their longans. Any situation that may obstruct the trading of the cooperative could inevitably lead to a serious effect on the growers.

What Pa Daet Longan Cooperative has is bargaining power, since its growers can produce 10,000 tons of fresh longans per year. Once an export order is received and both sides agree on the price, the cooperative will allocate the quota to its members equally and appoint the time and date for trading with its members.

Although the cooperative gains bargaining power when negotiating with importers, Chinese importers have a near monopoly on the market for longans in Chiang Rai. Nothing can guarantee whether the current bargaining power will continue to exist in the future.

#### *Physical flow*

Pa Daet Longan Cooperative purchases fresh longans only from its members since it is a non-profit organization, as previously mentioned. There are two types of longan sold by the cooperative: bunches of fresh longans for export as fresh longan (around 5 percent), and fall-off longans for processing for export as a dried product (around 95 percent).

The growers are responsible for transferring their longans to the consolidation center at the cooperative. Also, the cooperative requires growers to sort their fall-off longans and bunches of longans into four grades, i.e., "AA", "A", "B", and "C", before delivering them to the cooperative.

Once the growers hand in their longans, the cooperative will need to put those fall-off longans, which are already graded, into the automatic sorting machine again. The same is done for the bunches of longan; the fruit will be graded again, but using manual evaluation, before sale to the importer.

#### **1.2.3. Private consolidators**

Private consolidators run their businesses in the same way as the longan cooperative, with the same processes and procedures, except for the fact that private consolidators aim to maximize their profit whereas the cooperative is a non-profit organization.

The research showed that there are now both Thai and foreign longan private consolidators in Chiang Rai. Most of the foreign consolidators in Chiang Rai are Chinese who operate as self-suppliers for their main companies in China.

They face very low risk; if there are any fluctuations in the market price, they just change the price offered to the growers in order to maintain their profit margin. Once again, the growers have to bear the risk.

Nevertheless, private consolidators are still very exposed to any obstruction to international trade. As a matter of fact, if Thai exporters cannot export longans anymore, then they have no gap between purchasing and selling to get their income.

#### **1.2.4. Thai dried manufacturers and foreign dried manufacturers**

As mentioned earlier, the cost for investment in a drying factory is quite high, so there are only a limited number of dried manufacturers in each district. Dried manufacturers are responsible for processing the fall-off longans into dried longans before selling them to the importer, who finally exports to China.

### *Information and money flow*

In previous years, Thai dried manufacturers usually received an order from an importer before the harvest season, so they knew the amount of fresh longans to purchase, and also the price that could be offered to their supplier that could enable them to deliver the dried longans to their importer with a satisfactory profit. Currently, however, Thai dried manufacturers need to finish their production before calling the importer to negotiate and trade.

“We have to finish our production first before calling them and negotiating on the price. Then, they will come and check whether we have what they want or not before taking the final decision.”<sup>27</sup>

Dried manufacturers always announce the offered price on the board in front of their factory in order to motivate growers and consolidators to come and trade directly. At the same time, they also place orders with longan cooperatives. This is also one of the most serious problems they are facing. They have to follow the market price, which sometimes changes three to four times a day. Sometimes growers are waiting in the queue when the market price decreases; when manufacturers announce the new prices it leads to conflicts between them and the growers. In practice, it appears that manufacturers do not pass sudden price increases on to queued growers, instead paying the lower price shown on the board.

“As I have already mentioned, we have to follow the market price since we can only negotiate with the importers day-by-day. So that's why we also have to trade with growers by using the market price. But sometimes the market price changes while growers are parking in the queue for trading with me. Of course some get mad at me for changing the price.”<sup>28</sup>

We found that some dried manufacturers are owned or partly owned by foreigners; some legally share the business with a Thai partner, but others adopt the illegal practice of running the business behind the front of a Thai nominee owner (often by marrying a Thai who then serves as the nominee). Most of these foreign manufacturers run their business as a self-supplier for their own exporter, so we can say that it is part of the supply chain of the Chinese company. Most of the longans processed by these manufacturers are supplied to their own exporters or their chain.

### *Physical flow*

Thai and foreign dried manufacturers now purchase fresh longans from three suppliers: direct from growers, from longan cooperatives, and from private consolidators.

Although the dried manufacturers require growers to first sort the fruit by size, they will somehow re-sort again by using automatic sorting machines before paying at the size as defined by them.

After purchasing procedures are done, graded longan will be put in the drying area for 48 to 68 hours. Note that during the drying process, Chinese importers will send their inspectors to observe and control the process. After the graded longans have been dried, manufacturers will need to wait another 24 hours for the longans to cool down. Then the dried longans will be re-sorted again and graded before being packed, mostly into 10 kilogram paper boxes provided by the importers. Thai manufacturers will then call the importer and negotiate the price. Once both sides agree on the price, the importer will be responsible for the transportation of the box of dried longans from the manufacturing area.

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<sup>27</sup> Owner of a dried manufacturing factory in Phan District that purchased fresh longans from Pa Daet Cooperative, interview with author, Chiang Rai, June 2012.

<sup>28</sup> Owner of a dried manufacturing factory in Phan District that purchased fresh longans from Pa Daet Cooperative, interview with author, Chiang Rai, June 2012.

### 1.2.5. Importers/exporters

After the dried longans have been packed, they can be exported directly by the importer or pass through an exporter.

Sometimes, Chinese importers share their business with Thai exporters, so it is quite difficult to identify whether the exporter or the importer self-exports or not.

#### *Information and money flow*

After products have been packed and stored in the warehouse, dried manufacturers will inform importers/exporters and will ask them to come for negotiations. As mentioned earlier, dried manufacturers already grade their longans twice before trading with the importer, but the importers/exporters still find Improperly-graded produce mixed with the qualified graded produce. This causes them to pay more attention to the quality check before trading.

An export company representative said, "Sometimes we have found "A" size but they were indicated as "AA" size. So we have to pay them at the rate of "A" size, not at the rate they indicated."<sup>29</sup> He continued, "Yes, we often had arguments with the dried manufacturers on the grading identification. But it's not that often."<sup>30</sup>

#### *Physical flow*

After the negotiation on quantity and price are settled, the importers/exporters have two main transporting routes. For the first route, sea vessels transport exports to China via Laem Cha Bang Port in Bangkok. The importer/exporter will send a truck with a 40 ft. container and fill it with the boxes of dried longans, which might be from various manufacturers. The produce is then sent to the port in Bangkok for export via sea transport.

Sea vessel transport is very good for dried product transportation because dried longans are no longer a short-life scale product. But sometimes the exporter finds it a waste of time to transport the produce from the northern region to Bangkok, which requires around 12 hours.

"We can say that export through sea transport is the best way for us because it's very cheap. But anyway Chiang Rai is located very close to China, sending back to Bangkok before exporting North through the sea to China again is sometimes a waste of time for me."<sup>31</sup>

The second route is to export to China via Chiang Rai without transporting down to Bangkok first. Chiang Rai is located around 228 km from the border of the southern part of China, or a six-hour trip by road. Another way of transportation is river transport along the Mekong River through Chiang Saen Port. The Mekong River is an international river that passes through six countries including China and Thailand. There is currently an economic cooperation agreement between these six countries called GMS or Greater Mekong Subregion.<sup>32</sup>

The importers/exporters will send their trucks to the factory and load the products on the container trucks. Then, they will transport the products to Chiang Saen Port and load these containers onto ships to export the products via the Mekong River.

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<sup>29</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.

<sup>30</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.

<sup>31</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.

<sup>32</sup> Ishida, M. (2008), 'GMS Economic Cooperation and Its Impact on CLMV Development', in Sotharith, C. (ed.), Development Strategy for CLMV in the Age of Economic Integration, ERIA Research Project Report 2007-4, Chiba: IDE-JETRO, pp.115-140.

Everything sounds perfect with this mode of transport, except during a drought crisis that makes it impossible for any ship to navigate the river during the summer period.<sup>33</sup> Another problem is piracy on the Mekong River, which is too risky for some exporters. Some exporters thus prefer to send longans to Bangkok first and export through sea transport, following the traditional practice.

“It's too risky for our company. If something happens to my ship once, I have no money to produce those dried longans again. So exporting through Laem Chabang is quite fine for me.”<sup>34</sup>

### 1.2.6. Logistics Service Providers (LSPs)

Logistics Service Providers or LSPs in the supply chain for exporting longans to China are responsible for domestic and cross-border transport and for clearing the customs procedures.

In this case, we found that the LSPs for the longan supply chain can also include some villagers who provide some of these services, for example transporting produce from the garden to the consolidation area of the cooperatives or any destination within the district.

## 2. Non-Tariff Measures (NTMs) in longan trading

There is no official definition of Non-Tariff Measures (NTMs) in the WTO (World Trade Organization) agreements, or among international organizations.<sup>35</sup> Currently, various international organizations such as the EU, UNCTAD (United Nations Conference on Trade and Development), the WTO, and the ASEAN secretariat are working on classifying NTMs; they have classified NTMs into five main categories, which were analyzed by Julawadee and Vilailuck<sup>36</sup> as follows.

- 1 • Para-tariff measures, which are measures that increase the cost of import, for example the customs/import surcharge.
- 2 • Price control measures, which are measures to control the price of imported goods, for example the variable charge.
- 3 • Finance measures, which are measures that regulate the cost of foreign exchange for imports, for example advance import deposits.
- 4 • Monopolistic measures, which are measures that create monopolistic situations by giving exclusive rights to one or limited groups, for example having a single channel for imports.
- 5 • Technical measures, which are measures referring to the products' characteristics, quality, or safety, for example technical regulations.

Baldwin<sup>37</sup> defined NTMs as “any measure (public or private) that causes internationally traded goods and services to be allocated in such a way as to reduce potential real world income”, whereas the World Bank defined them as “quantitative restrictions and specific limitations that act as obstacles to trade”. Jensen and Keyser<sup>38</sup> stated that NTMs can be both good and bad. For

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<sup>33</sup> *Thairath Newspaper*, May 8, 2012.

<sup>34</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.

<sup>35</sup> Background note for UNCTAD's Group of Eminent Persons on Non-Tariff Barriers, First meeting (Geneva, July 12, 2006).

<sup>36</sup> Julawadee Worasakyothin and Vilailuk Tiranutti, “Non-tariff Measures in China: Cases of Thailand-china Fruit Trade and CCC Mark Requirements on Industrial Products,” the International Institute for Trade and Development (ITD), (2007).

<sup>37</sup> R. Baldwin, *Non-Tariff Distortions in International Trade* (Washington, D.C.: Brookings Institution, 1970).

<sup>38</sup> M.F. Jensen and J.C. Keyser, *Non-Tariff Measures on Goods Trade in the East African Community - Assessment of Regional Dairy Trade*. World Bank, (2010).

example, food safety standards, as good NTMs, are set to safeguard public health. But the NTMs can also be misused by requiring costly test procedures to import products.

Julawadee and Vilailuck found that most of the NTMs in agricultural sectors are under the category of technical measures on the Sanitary and Phytosanitary Standard (SPS) requirements as well as the related conformity assessment procedures and inefficient customs procedures. Not only are the imposed standards costly, but the problem is that the standards vary in each country.

In this research, we will try to identify the current NTMs that each player in the supply chain is facing so far, and the economic impacts upon them as a result of those NTMs, as well as their opinions on what future NTMs will be.

## 2.1. The current NTMs between Thailand and China and their economic impact

China banned all types of Thai longans in the middle of the year 2002 and early in 2003 by claiming the presence of excessive methamidophos residue. The fact was that methamidophos were only coating the shell of Thai longans in order to extend their storage life. Most Chinese, however, use their teeth to break the shell, so they were harmed by the methamidophos, which finally led to all types of Thai longans being banned. Since 80.86 percent of Thai dried longans are produced for export to China, the Thai government adjusted its strategy in order to help the players in the supply chain to distribute those 200,000 tons of longan by exporting to China through Vietnam instead, before successful negotiation with the Chinese government allowed the resumption of direct export.<sup>39</sup>

The above situation was the motivation for this research to study and analyze whether there are any other NTMs impacting on any of the players in the supply chain. Thailand is very sensitive to such potential barriers because Thai longan exportation truly depends on China, and since only a small change affecting one player in the chain can have an effect on others players in the whole chain.

More than just identifying the current NTMs, it is also important to understand the economic impact of those NTMs on each player. So we used in-depth interviews with each player to understand the economic impact of those NTMs on them.

Prapinwadee and Charuk<sup>40</sup> studied the impact of non-tariff barriers (NTBs) on fruit growers in the northern part of Thailand under the Free Trade Agreement (FTA) with China by applying economics methodologies in their analysis. They used Reveal Comparative Advantage (RCA), with import - export statistics as a data source to identify whether Thailand has a comparative advantage over China in longan trade. The results showed that Thailand still has a comparative advantage over China in the longan trade.

This research will now consider the economic impact of the NTMs, specifically in regard to income and employment, on each player by using "open coding" since most of the data obtained in this part is qualitative.

Open coding is the first analysis process in the coding process, which is essential in qualitative data analysis. Corbin and Strauss<sup>41</sup>, Strauss and Corbin<sup>42</sup>, Erikson and Kovalainen<sup>43</sup>

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<sup>39</sup> Ministry of Foreign Affairs, <http://www.mfa.go.th/web/1464.php?id=10451>

<sup>40</sup> Prapinwadee and Charuk, "Impact of Non-Tariff Barriers on Fruit Growers in Northern Thailand under FTA with China," International Conference *Sustainable Land Use and Rural Development in Mountain Areas*, Hohenheim, Stuttgart, Germany, April 16-18, 2012.

<sup>41</sup> J. Corbin and A. Strauss, "Grounded Theory Research. Procedures, Canons and Evaluative Criteria," *Qualitative Sociology* 13(1) (1990):3-21.

<sup>42</sup> A. Strauss and J. Corbin, *Basics of Qualitative Research* (Thousand Oaks, CA: Sage, 1998).

<sup>43</sup> P. Eriksson and A. Kovalainen, *Qualitative Methods in Business Research* (London: Sage Publications, 2008).

stated that open coding is followed by axial coding and selective coding. Open coding involves breaking down, analyzing, comparing, and categorizing data.

### **2.1.1. Growers**

#### Current NTMs

The research showed that, for growers, the most obvious barriers in the longan trade are technical measures in SPS requirements.

Longan growers are now required to have at least the GAP qualification (Good Agricultural Practices standard). The longan cooperative and private consolidators leave growers without the qualification as the last option when purchasing fresh longans. The importers prefer longans originating from growers with GAP standards.

Before 2006, Chinese importers didn't require the growers to be qualified to the GAP standards. They just purchased through cooperatives and private consolidators with no specific requirement for the growers.

A grower and cooperative member explained, "I know nothing about the GAP; I just sold my longans to the cooperatives until the year 2006 when cooperatives promoted GAP standards to their members."<sup>44</sup>

"I have to be qualified by the GAP standards since most of the members here are qualified. Otherwise I would get a lower price than others."<sup>45</sup>

#### Economic impact

There are currently 946 members in Pa Daet Longan Cooperative, with an average income of about 70,000 Thai baht per year or around 6,000 Thai baht per month per family. Approximately 50 percent of their income, or 35,000 Thai baht, comes from the longan trade.

The research showed that the growers are the real victims of the NTMs. Whenever there are more SPS requirements, consolidators and dried manufacturers, and even the exporters, just pass responsibility for meeting those requirements to the growers.

The production costs of growers are increasing due to SPS requirements but the prices received just depend on the importer, which means that the improvement in the longan standards does not lead to the selling price being higher. Profit from longans will thus decrease, maybe to a level of under 60,000 Thai baht per year.

Also, growers were asked what they planned to do if China banned all types of Thai longans again, making it impossible to sell their longans. Very surprisingly, there is no plan yet. If China banned Thai longans again, the number of longan growers in Chiang Rai could seriously shrink.

"I think it's impossible since there are more than thousand million people in China and they just love to eat our longans. But if it really happens, then I also don't know what to do; maybe just go to Bangkok to work as a construction worker."<sup>46</sup>

"Although it took more than six years for my longan trees to produce their first crop, I still might have to cut them down and grow other trees instead because longan is my only income. Otherwise I have no money for my family."<sup>47</sup>

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<sup>44</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, June 2012.

<sup>45</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, June 2012.

<sup>46</sup> Mr. Boonsong Boonpeng, vice president and member (grower) of Pa Daet Longan Cooperative, interview with author, Chiang Rai, June 2012.

<sup>47</sup> Member of Pa Daet Longan Cooperative (grower), interview with author, Chiang Rai, June 2012.

## **2.1.2. Longan cooperatives and private consolidators**

### Current NTMs

The research found that the major barriers for longan cooperatives and private consolidators are still SPS requirements. But in fact, the cooperatives and private consolidators do not bear the costs of such barriers directly because if there are any SPS requirements, for instance GAP standards, responsibility for meeting the requirements are just transferred to the growers.

### Economic impact

Private consolidators sometimes have to purchase fresh longans at a higher price, even if the price received from the importer remains the same. Sometimes they can transfer this impact to the growers by lowering the purchase price for the growers and keeping their profit margin the same. Private consolidators are aware that fresh longans are perishable and growers cannot wait to sell because freshness directly influences the price received.

## **2.1.3. Dried manufacturer**

### Current NTMs

Once again, SPS requirements are the main barrier faced by the players in the supply chain.

Dried manufacturers, who are responsible for turning the fresh longans into dried longans, now face an SPS requirement, imposed by the Chinese importers, to put fresh longans through a 68-hour drying process. This specific requirement directly reduces the amount of dried longans produced by each manufacturer because of its capacity. Some factories can process 20 tons per batch while others can only produce less than 10 tons.

“In the past, there were no specifications on how many hours were required in the drying process. It depended on the technique of each manufacturer on how long they would need for the drying process. Some took only 30 hours whereas others could take 60 hours.”<sup>48</sup>

“Currently, our importer requires 68 hours, no less and no more, for the drying process. Otherwise they will not care to buy our dried longans any more.”<sup>49</sup>

We also found that the importers insist on sending their inspectors to control the drying process in order to monitor that the operation meets with the 68-hour requirement.

Another barrier, (which may not be included in the NTMs) that the manufacturers face is the importer's size grading. As already explained, manufacturers use an automatic sorting machine before and after the drying process. When the importer randomly checks produce size before estimating the price according to the size, the importer often declares that the produce is one size smaller than the size declared by the manufacturer.

“Sometimes it's obviously clear it was size “A”, but importers identified and were only willing to pay as size “B”, and many times we have to end up like that.”<sup>50</sup>

### Economic impact

We only found an impact on the income indicator; we found that the SPS requirements did not hurt dried manufacturers much since they just pass measures on through to the consolidator and grower. But the SPS requirements have a direct impact on the income of the manufacturers because of the expense of involving the Chinese inspector in the drying process. Manufacturers

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<sup>48</sup> Representative of a dried manufacturer in Pa Daet District, interview with author, Chiang Rai, June 2012.

<sup>49</sup> Owner of a dried manufacturing factory in Phan District that purchased fresh longans from Pa Daet Cooperative, interview with author, Chiang Rai, June 2012.

<sup>50</sup> Representative of a dried manufacturer in Pa Daet District, interview with author, Chiang Rai, June 2012.



have to pay for the inspectors, but again, they just pass on these costs to the growers by lowering the purchase price offered to the growers.

The change in the ordering process that was mentioned earlier causes manufacturers more difficulties in controlling their costs.

“In the past we knew how much they wanted and at what price. We then knew how much and what price should we buy the fresh longans from our supplier. But now we know nothing until our production is finished. It's very risky for us.”<sup>51</sup>

“After dried longans are packed into boxes, we call our importer to come and negotiate the price. Even if the price received can be higher if we wait a few months longer, we cannot wait because we have spent almost 20 million Thai baht on purchasing fresh longans and it's better to get the money back and stop the interest payment to the bank.”<sup>52</sup>

The in-depth interviews enabled us to find very insightful information and the opinions of the dried manufacturers about trading in longans with the Chinese. As well as the economic impact, it can be very useful to understand and analyze the power of China on the supply chain for longans in Chiang Rai.

“Although we were not so much hurt from the SPS, our profit has become less and less. One day we may get no profit and need to close our factory; most players in the chain will also collapse. No one will purchase the longans from the cooperative or any private consolidator. Then the growers have no place to distribute their longans even at a price lower than their production cost.”<sup>53</sup>

#### **2.1.4. Importers/exporters**

##### Current NTMs

The main NTM affecting importers and exporters on trading longans between Chiang Rai and China is again under technical measures, regarding the issuing of a phytosanitary certificate.

We found that, since four or five years ago, exporters have been requested to submit a phytosanitary certificate issued by Thailand's Department of Agriculture when exporting to China. The Office of Agricultural Economics<sup>54</sup> reported that Thai and Chinese governments agreed on expanding their longan trade in 2004, and Thailand agreed to submit a phytosanitary certificate when exporting longans to China.

An export company official explained, “We were just requested to submit a phytosanitary certificate when exporting longans to China about five years ago. It caused our exportation to become much more complicated and to take more time.”<sup>55</sup>

Another NTM that exporters face is the Value Added Tax (VAT) from China. China will collect a 13 percent VAT charge per shipment, with the value of the shipment depending on the grade of the produce. The problem is not the 13 percent VAT itself, but that the value evaluation is made by the Chinese officers, not on the exporters. This result was supported by reports of the Department of Foreign Trade<sup>56</sup> and *Than* news,<sup>57</sup> which stated that the value evaluation of Chinese

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<sup>51</sup> Owner of a local dried manufacturing factory in Phan District in business since 1992 who purchased fresh longans from Pa Daet Cooperative, interview with author, Chiang Rai, June 2012.

<sup>52</sup> Representative of a dried manufacturer in Pa Daet District, interview with author, Chiang Rai, June 2012.

<sup>53</sup> Owner of a dried manufacturing factory in Phan District who purchased fresh longan from Pa Daet Cooperative, interview with author, Chiang Rai, June 2012.

<sup>54</sup> Office of Agricultural Economics, <http://www.oae.go.th/NewsInter/>.

<sup>55</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.

<sup>56</sup> Department of Foreign Trade, *Longan trading situation*, 2011, <http://www.dft.go.th>.

<sup>57</sup> *Than* news, June 2010, <http://www.thannews.th.com>.

officers for collecting VAT was unstable, sometimes too high and sometimes too low, making it difficult for Thai exporters to manage their selling price.

### Economic impact

The economic impacts from NTMs on importers/exporters found in this research were mostly regarding the income.

The Value Added Tax (VAT) at 13 percent calculated from the value evaluation done by Chinese officers caused difficulty for the exporters in controlling their costs since the VAT they have to pay on each shipment is not stable.

The submission of a phytosanitary certificate can have both a positive and negative impact. On the positive side, it can increase employment because the exporters need to run the process to obtain the certification in parallel with the manufacturer's production process. So they need to hire more people to handle the certificate issuance. On the negative side, since they need to hire more workers, their profit decreases from hiring those workers to obtain the certificate on time.

## **2.2. The expected future NTMs**

For this final part of the research, the key players in the supply chain were asked to give their own opinions on future expected NTMs on their business.

### **2.2.1. Growers**

Most of the growers expected that future NTMs on their work might be some other kinds of agricultural standards.

"I really have no idea! Maybe another agricultural standard just like the GAP standards."<sup>58</sup>

### **2.2.2. Dried manufacturers**

The manufacturers are concerned about standards regarding the specific condition or appearance of longans.

"My importers now spend more time on checking the color of our longans. So maybe in the future they might issue some regulations to reject our longans by using the standards or conditions of the appearance of longans, for example the color of the shell."<sup>59</sup>

We also get very insightful information and a useful recommendation from an officer of a dried manufacturer.

"The government doesn't need to spend much money on helping us (players in the longan supply chain in Chiang Rai); the best and easiest way to improve our business is just to issue some policies to manage the Chinese importers since they are now everywhere in Chiang Rai, and absolutely control the longan prices in Chiang Rai."<sup>60</sup>

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<sup>58</sup> The president of Pa Daet Longan Cooperative who is also a grower, interview with author, Chiang Rai, June 2012.

<sup>59</sup> A representative of a dried manufacturing factory in Pa Daet District, interview with author, Chiang Rai, June 2012.

<sup>60</sup> The owner of a dried manufacturing factory in Phan District, interview with author, Chiang Rai, June 2012.

### 2.2.3. Exporters

Exporters are concerned about customs procedures that might become more complicated and that might take more and more time.

“I really have no idea on this. Maybe the customs procedures in both Thailand and China might require a more difficult process or more documents, and finally customs procedures will take more time.”<sup>61</sup>

## Conclusion

The players in the supply chain to export Chiang Rai's longans to China are very exposed to Non-Tariff Measures from China since more than 80 percent of Thai longans are exported to China. The supply chain players don't have any contingency plans to handle the effects of such NTMs on their business, especially in the event of a crisis situation in which China might ban Thai longans again. The growers would suffer most from NTMs and there are no solutions yet, except for leaving Chiang Rai and taking their families to become construction workers in a big city like Bangkok. For the further research it would be very interesting to forecast and quantify economic or socio-economic impacts by using economics or statistical techniques.

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<sup>61</sup> Representative of an export company in Chiang Rai, interview with author (Phattaraporn) via telephone, Chiang Rai, June 2012.