



## Sustainable management for the Nakhon Chai Si Pomelo

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### Abstract

The Nakhon Chai Si Pomelo is the Geographic Indicator (GI) of Nakhon Pathom province, Thailand. Pomeloes first appeared in the province in the mid 19th century. Urban expansion since the early 1960s has caused the loss of agricultural land, resulting in a 50% reduction in pomelo cultivation. In order to preserve the pomelo for the province, the researchers analyzed documents and interviewed government officials and agriculturists. This paper discusses some issues arising from the data, including land inheritance, natural disasters, soil quality, the cultivation period needed, and quality control. The paper suggests ways to preserve the pomelo and disseminate knowledge to the community for its sustainable management.

**Keywords:** the Nakhon Chai Si Pomelo, knowledge management, sustainable existence

**Article history:** Received 11 November 2016, Accepted 31 August 2017

### 1. Introduction

All provinces in Thailand have their own unique commodities, tourist attractions, culture, and agricultural products which are presented in advertising slogans which list the special features of the province. In Nakhon Pathom province, one special commodity is the “pomelo”. The fact that it is the only fruit appearing in the slogan demonstrates emphatically that the pomelo is very important. The Nakhon Pathom pomelo, popularly known as the “Nakhon Chai Si Pomelo”, grows in three districts: Nakhon Chai Si, Sam Phran and Phutthamonthon. [1] It has been classified by the Thai government’s Department of Intellectual Property as a significant fruit both economically and symbolically and patented as a geographical indicator (GI) because of its unique taste. Under the name of the “Nakhon Chai Si Pomelo”, these are five varieties of pomelo; namely, Thongdee, Kaownampueng, Kaowpuang, Kaowpan and Kaowhom.

Although, the Nakhon Chai Si Pomelo is considered so important, pomelo growers have faced many threats including insect pests, diseases, natural disasters, the loss of agricultural land and a lack of successors to grow pomelo which was caused by urban expansion. In 2011 floods damaged many crops including the Nakhon Chai Si Pomelo. After these floods, some agriculturists turned to other occupations. As a result, pomelo production dropped and it became necessary to find ways to address the problems and sustainably support pomelo agriculture.

### 2. Research objective

The objectives of this research were to examine the background and analyze problems and obstacles

affecting sustainable management of the Nakhon Chai Si Pomelo.

### 3. Methods

This research integrated qualitative research and knowledge management. Unit of analysis was six agriculturists and three officials of the public sector such as Chief of District Agricultural Extension Office. The research methods was divided into two stages that were:

3.1 Study related documents and research about history or background of Nakhon Chai Si Pomelo, problems and threats influencing sustainable existence of Nakhon Chai Si Pomelo, knowledge management and self-management of agriculturists.

3.2 In-depth interview to get insights about history or background of Nakhon Chai Si Pomelo, problems and threats influencing sustainable existence of the Nakhon Chai Si Pomelo, knowledge management and self-management of agriculturists.

### 4. Results and discussion

#### 4.1 Background of Nakhon Chai Si Pomelo

The findings of this research revealed that Nakhon Chai Si was the famous planting of pomelo in Thailand. The pomelo in this area was very well-known because of its delicious, sweet and no bitter flavor. But from studying background, it was not pinpoint exactly that who was the first to bring pomelo grafts planted in this area. It was assumed that Chinese took pomelo from Thon Buri plantation to crop in Nakhon Chai Si. In an official report of Ratchaburi province, Nakhon Chai Si county, was explained that “*Chinese people*

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*were growers and they persevere to cultivate pomelo with all of their laboriousness.”*

#### **4.2 Turning points of the “Nakhon Chai Si Pomelo”**

1860: Maha Sawat Canal (Khlomg Maha Sawat)

Digging of Maha Sawat Cannel was led to continuously expand farmland and water transportation in this area. Among the plants that grew there, pomelo was a reputation for good taste because the climate and soil mineral in this area was very suitable for pomelo. It was known as the “Nakhon Chai Si Pomelo”. It was gradually more popular and became a major plant in this area.

1895: The establishment of Nakhon Chai Si County

1903: The Southern Express Railway

This railway from Bangkok Noi to Phetchaburi was opened and passed this area. This was a key turning point in economy and reputation of the “Nakhon Chai Si Pomelo”. The dissemination of pomelo quickly expanded to other areas so the “Nakhon Chai Si Pomelo” was better known.

1912: American Consulate asked grafts to grow the “Nakhon Chai Si Pomelo” in California. Accordingly, it was the plants of Goodwill between Siam and United States.

1913: England also asked branches to grow the “Nakhon Chai Si Pomelo” in Eastern Africa due to the famous taste of the “Nakhon Chai Si Pomelo” was generally known. This event supported that the “Nakhon Chai Si Pomelo” was popular and famous as well.

1912-1913: There was a modification for taxation from a tax on revenue to a tax on fruit tree. It demonstrated that pomelo planting was widely and popular to meet the need of more consumers. The tax rate was 1 satang per 1 pomelo tree. (It was high around 1.25 meters.)

1917-1918: Nakhon Chai Si was flooded but was not got many damages.

1925: The “Nakhon Chai Si Pomelo” was displayed in Siam Rath Museum at Lumpini Park.

1942: The big flood caused the reduction of pomelo fruits, but the consumers’ demand for pomelo was increasing.

1961: The First National Economic and Social Development Plan promoted people to use the land for cultivation. For this reason, the “Nakhon Chai Si Pomelo” became the economic plant of Nakhon Pathom, Thailand.

1969 The construction of the Vajiralongkorn Dam affected the Nakhon Chai Si river's water level. Then the farmers decided to plant many fruit trees.

1984: Borommaratchachonnani Road was opened which affected the socio-economic changes in this area.

2005: The “Nakhon Chai Si Pomelo” was selected to be the Geographical Indicator fruit (GI) of Nakhon Pathom province by Department of Intellectual Property, Thailand. Even though, there are many pomelo varieties in Thailand but the “Nakhon Chai Si Pomelo” was the

first one that everyone remind and was familiar with its flavor. Consequently, it was an identity of the “Nakhon Chai Si Pomelo”.

It was summarized as the Figure 1.

#### **4.3 Sustainable existence of the “Nakhon Chai Si Pomelo”**

After flooding since 2011, a lot of pomelo died. There were few plantations left. This natural disaster was very difficult to predict and fully prepare against, and had incredibly far-reaching consequences for the safety and wellbeing of individuals and communities. When the flood water was high, they lived in the boat, stayed and slept afloat for longer periods of time. They accessed to services for communities, like drinking water, health facilities and consumer goods by donation from other provinces.

After the water dropped, the farmers received compensation from the government THB 5,000 per rai. They tried to plant pomelo again. They also got pomelo’s grafts from government. Unfortunately, the productivity from these grafts had a sour taste. They solved this problem by buying grafts from other farmers that they ensured its good flavor and their plants were not affected by flooding. The farmers thought that there were no technique in growing pomelo and the good flavor of the Nakhon Chai Si Pomelo came from soil fertility. The cultivated area in Nakhon Pathom contained soil with suitable nutrients for planting. However, they encountered many problems which were plant disease and insect, high production cost, pre-harvest fruit drop, soil deterioration, acid soil, climate change, inconsistent quality, low quantity, very high standard for export, lack of new market and invasion of product from other areas.

When the farmers had no income from pomelo, they earned money in other ways such as an employee, harvesting other plants for selling. They also planted home-grown vegetables because it took a little time to reap. They had to sell other plants in their courtyard in order to raise money. The growers believed that the “Nakhon Chai Si Pomelo” remained forever because they and their children have continued to grow pomelo further because they loved and prided of the “Nakhon Chai Si Pomelo” [2, 3].

#### **4.4 Problems of the “Nakhon Chai Si Pomelo”**

From data collection [2, 3], it found many problems that were concluded as follows:

##### **1) Problem about workers and successors**

All agriculturists encountered the lack of labor and successors because pomelo cultivation was a hard work. For this reason, pomelo farmers and their families cultivated the pomelo by themselves.

##### **2) Problem of natural disaster and soil quality**

Flooding usually occurs in this area. The old pomelo tolerated to flood. After flooding, the farmers encountered the problems of solid soil, acid soil and soil deterioration. Although they encountered inconsistent

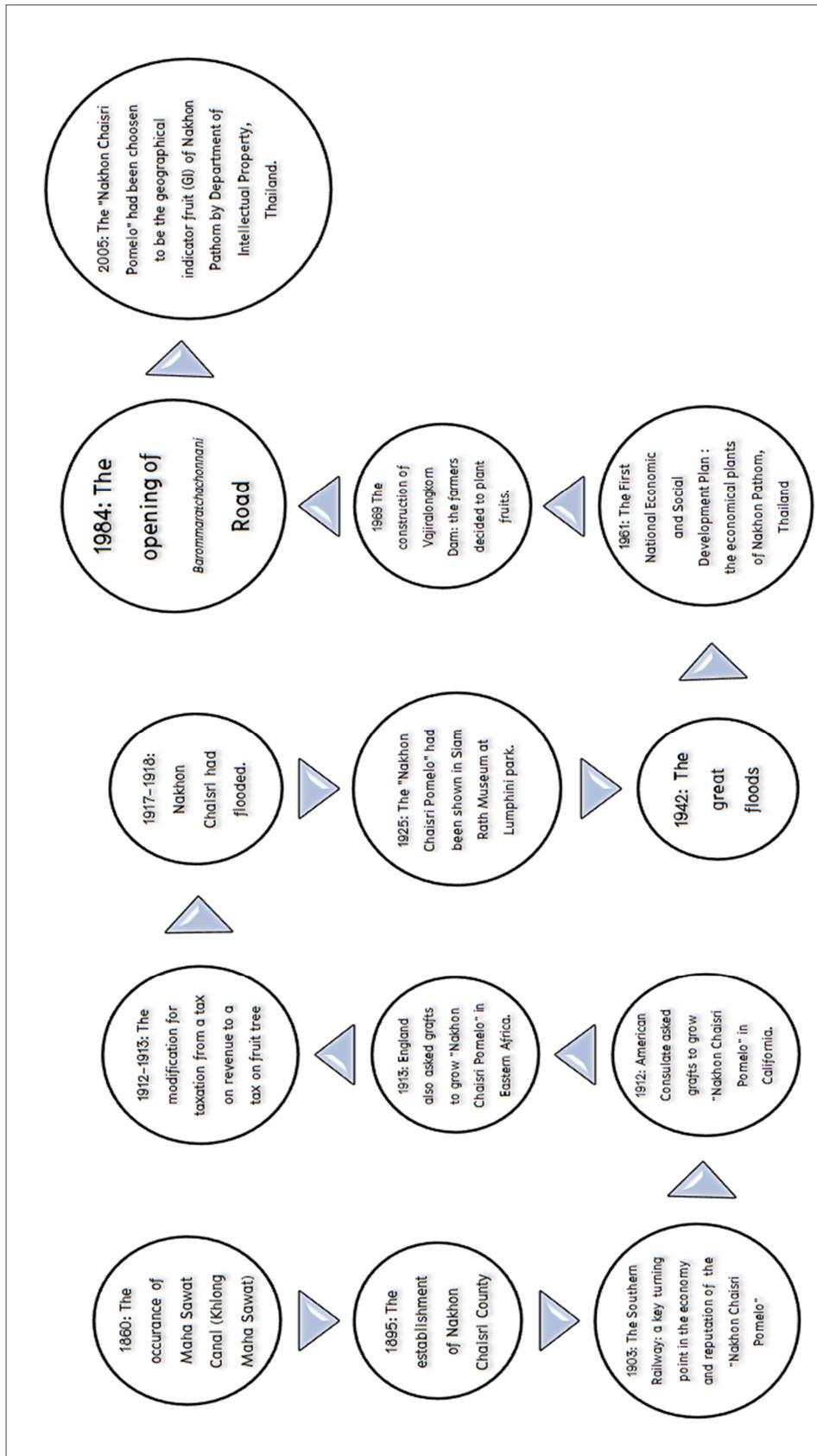


Figure 1 Turning points of the "Nakhon Chai Si Pomelo"

fruit quality and low produce quantity, they tried to adjust with a variety of methods with knowledge of soil management and soil amendment by using organic fertilizer.

### 3) Problem of funding, harvest and revenue

Funding was a major factor for pomelo cultivation. Pomelo needed time for at least five years from growing to harvesting. Pomelo farmers should have enough money to maintain the trees until they yielded. They cropped short-lived plants such as vegetable, lemon grass, banana, flowers in the space left from pomelo cultivation because it took a short time to harvest. They got income from these short-lived plants during they waited for the harvest of pomelo tree. Moreover, the government policy, especially rice mortgage insurance policy, affected to the decision of the farmers. Some farmers decided to abandon pomelo cultivation and they were interested in growing rice instead.

### 4) Problem of land for cultivation

Because of the expansion of the city, the land prices were risen and the growers sold their land. As a result, land for cultivation decreased. But there were plantation in some areas because Agricultural Land Reform Office specified space for only cultivation and the farmers were not able to sell.

### 5) Problem of quality control by GAP (Good Agricultural Practices)

GAP (Good Agricultural Practices) have been developed in recent years by the food industry, producers organizations, governments and NGOs, aiming to codify agricultural practices at farm level for a range of commodities. The objectives of GAP were to a varying degree ensuring safety and quality of produce in the food chain, capturing new market advantages by modifying supply chain governance, improving natural resources use, workers health and working conditions, and/or creating new market opportunities for farmers and exporters in developing countries [4]. Appropriate adoption and monitoring of GAP helps improve the safety and quality of food and other agricultural products. It may help reduce the risk of non-compliance with national and international regulations, standards and guidelines, regarding permitted pesticides, maximum levels of contaminants in food and non-food agricultural products, as well as other chemical, microbiological and physical contamination hazards. Adoption of GAP helps promotes sustainable agriculture and contributes to meeting national and international environment and social development objectives [5].

Although, the public sector tried to create income sustainability by encouraging the farmers to perform GAP (Good Agricultural Practices), this performance was a big problem for the farmers. It was because there were many steps to do so, and they thought that GAP made many troubles for them.

## 5. Conclusion

The important lessons learned for sustainable management of the “Nakhon Chai Si Pomelo”, that enabled the agriculturists to survive until the present, can be summarized into four points as follows:

1) The agriculturists based their concept on **the philosophy of sufficiency economy** including three pillars [6]:

**Moderation:** Sufficiency at a level of not doing something too little or too much at the expense of oneself or others, for example, producing and consuming at a moderate level.

**Reasonableness:** The decision concerning the level of sufficiency must be made rationally with consideration of the factors involved and careful anticipation of the outcomes that may be expected from such action.

**Risk management:** The preparation to cope with the likely impact and changes in various aspects by considering the probability of future situations. Decisions and activities must be carried out at a sufficient level depending on two conditions which are **knowledge**, comprising all-round knowledge in the relevant fields and prudence in bringing this knowledge into consideration to understand the relationship among the field so as to use them to aid in the planning and ensure carefulness in the operation and **virtue** to be promoted, comprising the awareness of honesty, patience, perseverance, and intelligence in leading one's life.

2) The agriculturists have their own technical adaptation. They adjusted their production techniques and factors of production in accordance with the changes around them. Moreover, they still maintaining natural and traditional methods of production.

3) The agriculturists exchanged ideas and information with others in order to keep up with market plan, market conditions and production techniques.

4) The agriculturists had concern, caring, brotherhood and grateful with each other. They were very supportive. When they faced with the disaster, they did not hesitate to assist each other.

These four lessons learned which enabled the “Nakhon Chai Si Pomelo” agriculturists to survive, would be useful methods for other types of agriculturists to follow and adjust in order to keep up with socio-economic changes while retaining their own identities.

## Acknowledgements

This research was supported by The Thailand Research Fund (TRF) and Nakhon Pathom Rajabhat University.

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