

# The present circumstances of teak wood processing, marketing and future prospects in Northeast Thailand

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## Abstract

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The present circumstances of teak wood processing, marketing and future prospects in northeast Thailand were studied in order to improve teak plantation management by local farmers. The first is to rationalize the log purchase prices of middlemen or sawmill factories; the second is to simplify complicated formalities on teak trading. To tackle these obstacles, governmental support should be provided to empower the financial and human resources of private forest owners on a cooperative basis. Log auction markets, moreover, can undertake a significant role as follows: A log auction market can provide a farmer with price information, which would otherwise be hard to obtain, in order to eliminate unfair low prices offered by brokers etc., and ensure that materials of the quality and quantity demanded by wood processing contractors can definitely be supplied. The stable just-in-time supply to meet this demand can be implemented, provided a log auction market is established and all base and price / stock information of the market is shared mutually via an information network. Establishment of such log auction markets should be more feasible, if government support can be introduced in the form of loans for purchasing logs and to cover other running costs for log auction markets, etc. For the time being, private forest owner cooperatives or united organizations should undertake the role of management of log auction markets, because such cooperatives have been publicly organized. If a private forest owner cooperative manages a log auction market, members or farmers can expect stable demand for teak logs at a fair auction price, which paves the way for farmers to become motivated to manage teak plantations.

**Keywords:** teak, farmers, wood processing, log auction markets, cooperatives

## Introduction

Natural teak forests are only located in northern and western Thailand. These regions have long gained a reputation as high quality teak furniture production areas. However, the natural teak forests there have declined due to the abundance of teak product exports to developed countries and the supply to the domestic urban markets, hence teak logs harvested from man-made teak forests have replaced the natural source. Conversely, there is poor demand for man-made teak logs in northeast Thailand because this region has no natural teak forests and had no teak wood processing industries until the mid-1990s.

While some teak log markets have already been established and many private teak wood processing facilities operate actively in north and west Thailand, there are also a few teak sawmills and markets in northeast Thailand.

Since 2006, we at the Japan International Research Center for Agricultural Sciences (JIRCAS) have been engaged in cooperative research in close cooperation with the Royal Forest Department (RFD), in developing techniques for nurturing beneficial indigenous tree species, and have also engaged in joint research into a complex business model for farming and forestry, which involves the agricultural management of indigenous tree species, with a focus on teak, in order to support efforts to improve the lives of small-scale farmers in northeast Thailand. This project further develops the Reforestation and Extension project of the Japan International Cooperation Agency (JICA) in northeast Thailand (phase II) (REX II project), which was implemented between 1999 and 2004 (Suzuki 2004), and represented an ambitious attempt to remedy the current economic condition of the small-scale farmer.

The purposes of this paper are 1) to analyze the present circumstances of teak wood processing and marketing; and

2) to show future prospects in northeast Thailand as compared to traditional teak product areas in northern and central Thailand.

### Materials and methods

The actual condition of methods of purchasing teak logs, marketing of teak products and management of wood processing facilities were surveyed at teak processing facilities in Udon Thani, Nong Khai, Nong Bua Lam Phu and Loei Provinces in northeast Thailand since 2006. Two private forest plantation cooperatives in central and north Thailand were introduced for comparison with cooperatives in northeast Thailand.

Price information on teak logs and teak forest practices were surveyed at RFD regional offices in northeast Thailand.

### Results and discussion

#### 1. Teak processing facility in northeast Thailand

##### 1) Nong Han Furniture (Udon Thani Province)

This facility was established in 2002, and represents a model teak processing facility in the Nong Han area, owned by a policeman. The reason why he started a teak afforestation and processing facility are: he sometimes arrested farmers who cut teak logs for their own consumption without official permission and recognized that teak tree plantations were essential for farmers wanting to get teak logs for their own use. In addition, a teak processing facility was necessary for teak farmers wishing to sell teak logs.

The owner took furniture making training course at the REX center in Yasothon before starting his own business. At present, six craftsmen produce tables, chairs, beds, door panels, robes and floors (Fig.1). The maximum production capacity is 20 sets, which consist of 1 table and 3 chairs, per month. This facility purchases teak logs of 90-120 m<sup>3</sup> from 3 or 4 neighboring farmers each year. The average price for teak logs of 6 m in length and 50 cm girth is 200 baht (JPY 800) each.

The main market for teak furniture is the Udon Thani area, and the product quality is so good that they are acclaimed by customers. Furthermore, the furniture is also exported to USA through an American middleman living in Udon Thani city.

The current problems of his business are: firstly the limited number of teak product markets around the Udon Thani area, and secondly, teak farmers lack sufficient incentive to own teak forests because teak product markets are so narrow and the distribution quantity of teak products so restricted, and thirdly, the lack of money to buy logs and expand his facility. Recently, the owner is anxious over the problem of farmers cutting teak trees and replanting them with eucalyptus or rubber trees.



**Fig.1.** Teak furniture processing works at Nong Han Furniture, Udon Thani Province

##### 2) Nong Bua Lam Phu Forest Plantation Cooperative (Nong Bua Lam Phu Province)

This plantation cooperative was established in 2000 by the Forest Plantation Act. A furniture facility was built in 2002. The territory of this cooperative encompasses 6 counties in Nong Bua Lam Phu Province and 311 members. There are 13 board members, with 2 persons elected per county.

This cooperative provides some teak log price information, secures middlemen for members and manages wood processing and sales businesses. These activities are effective trials to overcome marketing problems facing such small-scale farmers.

The management conditions of this cooperative and willingness of members were surveyed. Of all the members, 80% of the members who lived in the territory planted teak trees were under the 3,000 baht project (silviculture subsidy project) and 20% of members were non-resident forest owners. The teak forest area owned by members was 8,000-9,000 rai (1,300-1,500 ha). At the beginning of the project, the members hoped that they could harvest and gain 400-500 baht per tree, 6-7 years after planting the teak seedlings. However, as they found that it was impossible to gain the expected income within such a short period, they rapidly lost their enthusiasm for teak plantations. The cooperative constructed a wood processing facility financed by an NGO's low interest loan in order to show the potential of processing value-added teak products from woods with smaller trees.

As of 2009, the teak processing facility produced windows (100-150 per month), doors (20 per month), swing chairs and etc. (Fig. 2). This facility includes a dry kiln and an underwater log stock site. The total number of employees was 6, of whom 4 worked at the sawmill and 2 at the furniture facility.

The cooperative obtains teak logs easily because many farmers want to sell them and can process a maximum of 150 m<sup>3</sup> teak logs per year. This volume indicates that it is impossible to buy all the wood harvested by members, in other words, oversupply. The market for the teak products is also limited around the facility due to the small-scale nature of production. Fortunately, a big company namely "Green



**Fig.2.** Teak furniture at private plantation cooperative, Nong Bua Lam Phu Province



**Fig.3.** Finger jointed teak lumber at Nong Khai ANP Import and Export Co.Ltd., Nong Khai Province

Group” contacted this cooperative through the RFD website last year and has already sold 100 sets of door frames for 200,000 baht.

The price of teak logs is decided by the cooperative committee based on information from middlemen and the Forest Industry Organization (FIO) (Noda et al. 2011). A committee member said that though the quality of teak products (oven-dried) made by this facility was relatively good compared to natural dried products coming from north Thailand, the price was cheaper due to competition with the latter.

Current problems facing this cooperative include the lack of funds to buy logs, lack of skilled workers and decline in motivation of members to maintain teak forests caused by low log prices.

### **3) Nong Khai ANP Import and Export Co. Ltd. (Nong Khai Province)**

This company was established in 2003 and is the largest teak sawmill in Nong Khai area. The main products are boards and finger joint lumber, the teak production volumes of which amount to 14 and 34 m<sup>3</sup> per month respectively. The channels for purchasing teak logs include farmers’ offers and negotiation with farmers based on information from middlemen. Though the areas in which teak logs are purchased are Udon Thani and Nong Khai Provinces, this company also collects teak logs from north Thailand and imports them from Laos casually because teak logs have tended to be in short supply recently in Nong Khai Province.

The reasons why farmers around this area offer to sell teak logs are the relatively high prices and cash settlement. Furthermore, this company has a price table of logs and the prices have remained unchanged since the company was first established.

This company has 20 regular employees and 60 part-timers. The pay is 10,000 baht per month and 150 baht per day, respectively.

The teak products are mainly sold to the markets in Bangkok (60%), Nong Khai area (10%) and the Udon Thani area (30%). The transportation fee to the Bangkok market, which is the most important to this company, is

8,000 baht per lorry-load, 500 ft<sup>3</sup> (=14 m<sup>3</sup>).

A distinct feature of this company is the introduction of a finger joint machine in order to process the glued lumber from small teak pieces (Fig. 3). When considering the short history of teak plantations and the majority of small diameter log production, the introduction of the finger joint machine will be key to making value added teak products in this area.

### **4) Predakamai (Loei Province)**

This sawmill was established in 2002, followed by a furniture and wood crafts shop in 2006. Teak products include doors (10-20 pieces/day), window frames (200 pieces/day), door frames (50-100 pieces/day), transoms (100 pieces/day) and souvenirs, in addition, teak sawdust for mushroom beds and teak wood powder for aromatics. These products are sold in Udon Thani and Kong Ken areas of northeast Thailand.

This sawmill has 5 regular employees and 30-40 part-timers. The pay is 10,000 baht per month and 150 baht per day, respectively. Seven to eight pieceworkers make windows (15 baht/piece) and table sets (2,000 baht/set). As these kinds of teak products are popular in northeast Thailand, this shop cannot take up orders from customers.

The owner buys teak logs from small-scale farmers who own 10-20 rai of teak forest. As the farmers wish to change their teak forests to rubber tree forests, there are many offers from farmers wishing to sell teak logs. This situation results in the low price of teak logs, rendering it a buyers’ market. The price table is made by staff taking log girth, uses and operation costs into account and does not reflect the FIO price because FIO decides on the teak log price based on the relatively higher tree age (over 20 years old) and better quality logs than the teak logs produced in this area. In general, the price of FIO teak logs is twice that of those in this area.

In addition, this sawmill purchases 20,000-30,000 ft<sup>3</sup> (540-810 m<sup>3</sup>) of teak lumber per month, 70% of which is imported from Laos via a middleman and 30% of which comes from the Loei area. The prices of teak lumber from Laos are 280 baht/ft<sup>3</sup> with 4 by 4 inches and 350 baht/ft<sup>3</sup> with 5 by 5 and 6 by 6 inches.

**Table 1.** Prices of teak logs by girth

	Address (Province) Teak consumption	A	B.	C
		Udon Thani	Udon Thani	Loei
		24-25 m <sup>3</sup> /yr	800-950 m <sup>3</sup> /yr	8,000-12,000 m <sup>3</sup> /yr
1	Price per tree (at facility)	Length 4m, GBH more 50 cm; 200 baht/log	Length 4 m, GBH 50 cm; 300-500 baht/log GBH 50-90 cm; 600-800 baht/log GBH 90-100 cm; 1,000 baht/log	
2	Price per tree (at plantation)	GBH 76 cm; 400 baht/tree		Avg. 150 baht/tree GBH under 40 cm; 60 baht/tree GBH 40-50 cm; 100 baht/tree GBH 50-60 cm; 170 baht/tree GBH more 60 cm; 200 baht/tree
3	Price per rai (at plantation)	13 yrs old, 2 × 2 m; 16,000 baht/rai		

Source: Interview survey with owners

The owner of this sawmill expects to gain sufficient volume of teak logs in the next decade and plans to introduce finger joint machines.

For example, the prices of teak logs from 3 companies in northeast Thailand are shown in Table 1.

## 2. Current situation of private forest plantation cooperatives in central and north Thailand

### 1) Lop Buri Forest Plantation Cooperative (Lop Buri Province)

This cooperative was established in 2000 and is located in central Thailand, north of Ayutthaya. There are 206 members, 7 of whom are board members. If a farmer wants to join the cooperative, he or she must have been living in Lop buri Province and must own man-made forests. In addition, a registration fee (100 baht) and 50 units or more of subscription (10 baht/unit) are essential. Cooperative members were familiar with information on forestry-related laws and regulations. Furthermore, the cooperative precedes the purchase of teak logs from members who wish to sell logs to the cooperative.

Harvesting work is left to time-workers employed by the cooperative. Teak logs exceeding 40 cm girth are sold to 2 furniture facilities in this area and the remaining logs are sold to any willing customers (Fig. 4). The prices of teak logs are 700-1,000 baht per log with 50-80 cm girth and 2,500 baht per log with 80-100 cm girth, which are twice as high as elsewhere in the Udon Thani area and close to FIO prices. According to our sawmill survey carried out in north Thailand, all the owners said that it was impossible to buy logs with high FIO price. Considering this, the reason why the sawmills in this Lop Buri area can charge high prices for teak logs are its good location close to the major consumption center of Bangkok.

The cooperative sells teak logs to customers at prime cost plus 20% and pays a dividend to members when the cooperative gains a surplus. The surplus was 5% in 2006 and 2007.

We asked the chairman of this cooperative about the



**Fig.4.** Teak log selling on the roadside in front of the cooperative at Lop Buri forest plantation cooperative, Lop Buri Province

establishment of log auction markets, he answered that the market was necessary to gather together many suppliers and consumers. Conversely, he said that the current problem of this cooperative was the lack of a loan system to manage the cooperative. This means that the cooperative will be unable to set up a log auction market without some financial support by the government (Furuya et al. 2011).

### 2) Don Mol wood products cooperative (Phrae Province)

This cooperative, which is located in the suburbs of Phrae city, was established in 1997. Its members include small-scale wood craft facilities (200 owners), forest owners (50 persons) and teak wood products shops (13 persons). If someone wants to join the cooperative, he or she must pay a registration fee (100 baht) and 100 units or more of subscription (10 baht/unit). The members have a dividend of 5-10% when the cooperative gains a surplus. The main industries of the Don Mol area are forestry and wood processing. There are 9 wood products cooperatives in Phrae Province, 3 or 4 of which are in this area. This cooperative is the largest in Phrae Province and is characterized by the concentration of many wood processing facilities at the same site. The site is divided into 74 blocks and 18 owners have been operating there (Fig. 5).



**Fig.5.** Concentration of teak processing works at Don Mol wood products cooperative, Phrae Province

The rental fee for each block is 200 baht per month and the owners pay for the cooperative.

The members of the cooperative consume teak logs at a rate of 800 m<sup>3</sup> every month. Half come from FIO forests and the rest from private forests. The owner buys logs by him/herself, but the owner has to pay 100 baht/m<sup>3</sup> to the cooperative as a service charge.

The teak processing facility here can purchase FIO logs at relatively higher prices because they require high quality logs for high-grade furniture. As middlemen give information on the production of teak logs of private forests to the cooperative, it is not difficult for the cooperative to buy teak logs.

A secretary of this cooperative said that 40,000 m<sup>3</sup> of teak logs were produced every year, half of which were supplied from FIO forests. The demand for teak logs is so high that diversion of tree species from teak to another is uncommon in this area. The secretary of the cooperative is aware of the need to establish log auction markets, but considers it impossible because the cooperative lacks money to buy logs from farmers, which means it will be possible to establish log auction markets if the government makes funding systems for log auction markets available. This situation is the same as that faced by the Lop Buri Forest Plantation Cooperative.

### 3. Comparison of teak log prices between north and northeast Thailand

The teak log prices when purchasing from farmers are almost the same as north and northeast Thailand, but the FIO price in north Thailand exceeds that of northeast Thailand. Labor costs are almost the same between north and northeast Thailand. This means the teak processing facility in northeast Thailand would have to obtain cheaper logs and make high quality products like north Thailand. These conditions are essential to ensure northeast Thailand's wood facilities can compete in national and export markets against those in north Thailand, which have already established a brand image.

Table 2 shows the price information and quality

**Table 2.** Price information and quality estimation of teak logs

	North Thailand	Northeast Thailand
Price information	Based on the products price, FIO price table	Middlemen, RFD price table
Estimation of teak logs by customers	High quality	Area unsuitable for teak plantation

Source: Interview survey with stakeholders

estimation of teak logs between north and northeast Thailand. North Thailand has a long history of teak plantations and wood processing industry. The larger diameter teak logs are popular and the FIO price table is used by customers.

### Conclusions

Teak is a good example of a relevant major issue. For teak, there are a number of issues, among the first of which is the optimization of timber purchase prices from middlemen and wood processing facilities, and secondly, the need to simplify the cumbersome procedures required for the market development and sale of teak. To resolve these issues, the personnel and financial strength of forest owner cooperatives is necessary, and government support is also essential. Also, a log auction market can be effective in providing pricing information to teak farmers who find it difficult to obtain such information, eliminating the unreasonably low log prices presented by middlemen, and providing an outlet where wood processing facilities can obtain raw materials of the required quality and volume. By establishing such log auction markets in each region, and sharing the cargo and pricing information of each log auction market via an information network, a just-in-time system of stable supply can be created for teak consumers. Such approaches will likely encourage more farmers to manage teak forests.

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### References

- Furuya N, Noda I, Himmapan W, Komaki T (2011) Current situation and issues of forest owner cooperatives in Thailand (in Japanese). *Kanto Journal of Forest Research* 62:25-28
- Noda I, Furuya N, Himmapan W, Pusudsavang A, Komaki T (2011) Current situation on the teak wood trade and price formation in Thailand (in Japanese). *Kanto Journal of Forest Research* 62:29-32
- Suzuki T (2004) The Reforestation and Extension project in northeast Thailand (phase II) –Long-term specialist's general report– (in Japanese). JICA, pp1-105