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**THE THAI CABBAGE MARKET - ANALYSIS OF  
PRICE AND MARKET EFFICIENCY**

Master Thesis for the Program “Agricultural Sciences, Food Security and  
Natural Resources Management in the Tropics and Subtropics”

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## 6 SUMMARY AND RECOMMENDATIONS

### 6.1 SUMMARY AND RESULTS

The main objective of this case study was to examine and analyze the daily and seasonal price fluctuation of cabbage in Chiang Mai province in Northern Thailand. Furthermore, the market actors and trade flows of cabbage were identified and the efficiency of the cabbage market analyzed. As many farmers in mountainous regions of Northern Thailand rely on income from cabbage production this research attempts to shed some light on the cabbage market and gives recommendations on stabilizing the price for cabbage.

On the basis of collected data on production and marketing of cabbage three hypotheses in this study were tested. The first hypothesis of this study, "there exists seasonal as well as daily price fluctuation of cabbage in the Thai market due to distortion in markets or supply," was tested by cobweb theorem and time series analysis. The second hypothesis, "the volatile cabbage prices in Northern Thailand are a disadvantage for farmers and consumers", was tested by correlation coefficient, regression analysis and marketing margin. The last hypothesis, "efficiency of cabbage pricing and marketing could be improved through factors as infrastructure, pricing information system, cooperatives", will be discussed

In this study, the **pricing efficiency** is expressed by three different analyses: cobweb model, time series analysis and correlation coefficient.

The results of the cobweb theorem show the decreasing price and production fluctuation of cabbage over time period 1992-1999.

The seasonal and cyclical pattern of prices shows a slow increase (0.088 B/year) over a fifteen years long period (1985-1999). Time series analysis was used to predict the future value of cabbage in the Thai market by using seasonal decomposition procedure.

The high and positive values of correlation coefficients of nine retail markets in the research area determine a good integration between these markets and efficient operation in terms of price finding. The highest correlated prices of cabbage are in San Kampaeng market. And the less correlated prices are in Lumpoon market maybe due

to the fact that this market is located in another province than the others. The highest correlation is between San Kampaeng and Payom market (0.96) and the lowest between Lumpoon and Warorot market (0.73). Generally, the correlation is high maybe because of the same source of cabbage (Muang Mai wholesale market).

The **operational efficiency** in this study is expressed by regression analysis and marketing margins.

The results of regression analysis confirm the hypothesis that following variables (distance between markets, number of retailers selling cabbage, number of stands in market) have a significant impact at the 0.99 % level of the cabbage market price. The results also determine that other factors (i.e. turnover of the market, density of cabbage production near markets' location) which were not included in this model also affect the price.

The market margins of four different commodity chains and the share of retailer price were determined. The results show that retailers have the highest share of final cabbage price and middlemen the lowest. However, it should be noted that the marketing costs were not included in the trade margin, but they merely reflect the price margin.

## 6.2 CONCLUSIONS AND RECOMMENDATIONS

Many factors influence commercial agriculture, one of which is market accessibility. Markets must be accessible to farmers because participation in and access to agricultural markets positively influences productivity. To market access are linked for example price signals, market information i.e. grading, opportunities, etc. However, undesirable and unstable prices, malpractices in trading and lack of market information continue to be obstacles cabbage producers face. Especially farmers in remote areas have insufficient knowledge regarding prices and marketing practices. Therefore, improvements in market access, market efficiency and market integration are crucial to enable farmers to take full advantage of market potentials and achieve higher income levels.

Also fluctuation of cabbage production sometimes leads to oversupply in the markets of Chiang Mai and thus the price decreases. If the price is low profits for farmers diminish and they have less money available to investment in inputs. Consequently, with a decrease in investments the yields will decline and this in turn may affect the

level of income negatively. Insecure prices lead to insecure incomes and in turn to food insecurity for farmers. Therefore, the sustainability of incomes generated through cabbage production should be improved. This study attempts to make a contribution by determining the reasons for price fluctuations and analysing alternatives to create more stable prices to secure farmers' cash income which is a primary source of income for many farmers to meet the household demands.

Thai farmers, especially in mountainous regions, themselves need be better equipped with both experience and knowledge including appropriate farming techniques, farm business management, and technological know-how to increase bargaining power and decrease average cost of transactions.

Improvement in pricing and operational efficiency can be achieved with the following market tools:

1. transportation and communication facilities
2. pricing information system
3. wholesale markets
4. contract and credit farming
5. cooperatives and farmers groups
6. processing and export of cabbage

This is in regard to the third hypothesis: Efficiency of cabbage pricing and marketing could be improved through factors i.e. infrastructure, agricultural policies, cooperatives and pricing information system.

### **Infrastructure**

*Transportation and communication facilities:* Among various activities involved in the marketing system, transportation is the most important component of marketing cost. Therefore, any location having poor transportation and communication facilities will have less advantage in terms of market competitiveness.

A good example is the village Ban Pa Sampra, where some of the farmers don't grow cabbage for marketing purpose because of the bad conditions of the road, connecting their village with main road to Chiang Mai. In addition, access to the fields by pick-up is nearly impossible. The farmers' income decreases because of increased difficulties and transport costs.

- To improve market access, the good transportation facilities (i.e. good condition of roads connecting villages in mountainous areas) are needed.

*Pricing information system:* When the information system is poor, the merchants must rely on their own experience. Thus, wrong judgment can lead to inappropriate forecasts.

In the study area farmers will inform themselves before harvest on actual cabbage prices by calling the wholesaler in Chiang Mai. Wholesalers and farmers will set the amount and price on the telephone, according greatly to the wholesalers' demands, which depends on demand in Bangkok. The exact time of harvest and the selling price of cabbage depend on wholesaler decision. The cabbage market is dependent in wholesale trade and price signals are coming from Bangkok.

- To access market prices the communication facilities (i.e. telephone lines) in highland villages should be set up.

**System of wholesale markets:** Wholesale markets play an important marketing function in the cabbage market. In the cabbage marketing chain the wholesalers play an important role in the price finding and amount of traded cabbage.

- Vegetables markets should be better structured. For example the price distribution can be improved. Farmers in research area are informed about prices in Bangkok by radio, but there is no information system of local prices in Chiang Mai wholesale markets. There should be also set up more vegetables markets in research area. These markets will play the functions of assembly, price finding, and distribution. The market prices should be recorded and accessible to all market actors. Hence, such as wholesale system would induce higher marketing efficiency (i.e. pricing efficiency and operational efficiency).

### **Contract farming and credit farming**

Contract farming is used between farmers and traders, where traders provide inputs (fertilizers, seeds, etc.) to farmers growing cabbage and then buy their harvest. In the cabbage marketing the contract farming is not so wide spread. Generally, the contract farming gives the higher potential to farmers. Because farmers can get more support (material, technology and technical assistance) from government agencies and agribusiness companies. This increases the quality of products bargaining power and thus product price. The main advantage of contract farming is that farmers and

middlemen share risks more equally. The disadvantage for the producer is the lack of freedom to sell as he wishes and that the middlemen are the ones who determine price. With credit farming on the other hand, the farmers have the option to sell to whomever they wish but bear to the total risk.

In the research area, the credit farming is most common. Farmers pay all inputs needed for cabbage growing. After harvest they sell product to wholesalers or middlemen, depending mostly on the actual price and other conditions.

- Contract farming is recommended to farmers with no cash for investing in the inputs (such as fertilizers, pesticides, irrigation, etc) for cabbage production.

### **Cooperatives and farmer groups**

In order to stabilize the market prices and organize agricultural products which are usually supplied by innumerable small scale producers, it can be beneficial to form agricultural cooperatives. They contribute to both, farmers and consumers, by decreasing marketing margins, which lead to increases in farm income and lower consumer prices.

Cooperatives in Thailand basically exist for main crops and for lowland farmers. At present the cabbage market is driven only by private market actors. Hence, cooperatives can improve marketing efficiency and be beneficial for farmers. In Thailand there is no agriculture cooperative for farmers growing cabbage. In the study area it is difficult to form cooperative, because 150 members are required for its formation.

- The recommended solution is to establish instead of cooperatives 'farmer groups' with a required minimum of 30 members. It can easily be carried out within one village or farmers from the same area growing cabbage. Farmers can profit from increased bargaining power and lower transaction cost.

### **Processing and export of cabbage**

Cabbage processing is not wide spread in Thailand. And also the export of these processed products is very low. Cabbage is common vegetable in most of the Asian and European countries and there is no need to export this vegetable. The processing of cabbage is low because there are just few possibilities how to process cabbage in comparison with fruits.

The future research should be conducted on marketing efficiency measured with pricing and operational efficiency of other vegetable to determine if these results are unique to cabbage. The research can be also conducted in other parts of the world for the comparison with situation in Thailand.