Regoverning Markets
Small-scale producers in modern agrifood markets

# Innovative Practice

## Thailand
# Innovative practice in integrating small farmers into dynamic supply chains: the case of CMK housewives' group in the potato chip market

Aree Wiboonpongse, Songsak Sriboonchitta and Puttawan Khuntonthong
Changmai University

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# 1 Introduction

Potatoes were introduced as a cash crop to Thailand about forty years ago. Two types of potatoes are cultivated: processing variety (Atlantic) and table variety (Spunta), accounting for 90 per cent and 10 per cent of total production respectively. The production of both types is mainly concentrated in specific locations in northern Thailand. Potato growers in Chiang Mai[a], the first location of lowland potato production, have been cultivating table potatoes since the 1960s.

Potato is one of the few crops in the country for which the government has implemented a supply control policy. Since quality tuber seeds need to be imported, the annual extent of imported table type seeds is determined by the National Sub-committee on Production and Marketing Management for Garlic, Shallot, Onion, and Potato. Import procedure for table potato seed is shown in the appendix (Figure A). The Potato Growers Cooperative was formed to determine the annual amount of tuber seed imports and to decide on seed quota for its members. In the case of the processing type potato, the government allows firms to import tuber seed as required for processing.

Demand for potato has increased dramatically due to the popularity of both potato chips and tourism in Thailand. Most of the table potatoes are supplied to hotels, restaurants and supermarkets, while the processing potatoes are made into potato chips. The processing potato production area has expanded over the past ten years due to the rapid increase in demand for 'French fries' and snack chips. Processing firms have extended their contracts to many provinces in the north and three provinces in the northeast of the country. Nevertheless, they often face shortages of raw material, especially during the rainy season. Since all the processing potatoes of acceptable quality (90 per cent of production) are processed into potato chips by two large firms and distributed to middle and high level markets, it is rather difficult for small farmers to play any significant role in this industrial crop supply chain. However, the study found a housewives' group in the San Sai district of Chiang Mai that has managed to generate additional alternative family income from substandard potatoes and also become a small enterprise participating in the potato supply chain. Since a few large firms hold 99 per cent of the potato chip market share (Figure 3.3), these firms have a significant influence on consumers' demand and preference by investing a huge amount of money in product promotion and development. Therefore, this paper attempts to illustrate the performance of a community enterprise that has gained inclusion in the potato products supply chain by turning unwanted potatoes into usable material and also to highlight the role of a potato

[a] Chiang Mai is the second largest city of Thailand and a natural tourist attraction spot. It is over 700 years old and was once a capital city of the Lanna Kingdom.

housewives' group in providing an alternative for growers' market participation. Community enterprise management is the key innovation to inclusion of small-scale producers in the dynamic supply chain.

# 2 Data collection

Primary data were collected from growers, assemblers/brokers, two processing firms, members of the Potato Growers Cooperative and local officers and members of Chedi Mae Kraw Women's group in Chiang Mai Province. To provide further background of the marketing dynamics, six assemblers/brokers were interviewed to describe their roles in the marketing chain, their practices, and changes in technical and management innovation, market conditions and the historical background of the potato sector.

The large processing companies provided information on market trends and demand for snacks. Additionally, the firms provided a better understanding of quality of processed products as related to local and import raw materials. Secondary data and reviews of previous works provided background information for comparison with the current situation.

# 3 Background of the potato sector in Thailand

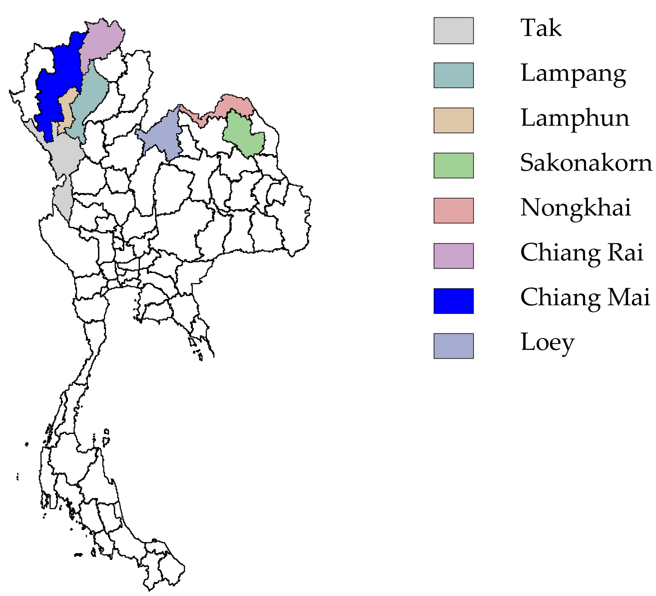
Farmers in the lowlands have been practicing potato cultivation in the cool season for as long as documents could be traced back, over forty years, since they have always found it to be the most profitable crop. Both government and non-government agencies have played significant roles in developing potato production by conducting many different researches regarding aspects such as variety selection, pest management, watering and fertilizer management to increase quality and yield. Consequently, a large number of cultivars have been tried out, both in farmers' fields and in experimentation stations.

## 3.1 Production

Due to the growth of tourism in the early 1980s, there was increased demand for table potato from hotels and restaurants. In the 1970s, a factory was set up to produce potato chips in response to an early trend in the snacks market. However, the firm was faced with an unstable and limited supply of raw material. To solve the problem, in 1987, the company drew up their first contracts with potato growers in Chiang Mai. The selected variety was Kenebec (DOA, 2005; interview,2006).

Northern Thailand has always been the major production centre for potatoes. In the 1970s and 1980s this area accounted for as much as 80 per cent of production. In 2005, the total production area was 17,126.8 acres and about 95 per cent of planted land was in the north. The national production reached 97,411 tons in 2005.

**Figure 3.1 Planted area of potato by province**



Presently, potato is ranked as a major crop in the north of the country, especially in Chiang Mai, Tak and Chiang Rai provinces (OAE, 2006) but it has also begun to gain importance in the three north-eastern provinces (Figure 3.1). The potato planted area is spread over eight provinces in the northern and northeastern regions. Chiang Mai, one of the provinces in the northern region is still the main potato producing area, accounting for 53 per cent of total production in 2005. Potato growers in this province take advantage of the favourable soil and climate conditions as well as the technology and knowledge provided by government and non-government agencies to produce good quality potatoes.

## 3.2 Demand for potato in Thailand and imports

Despite the fact that potato snacks are not traditional fare for the Thais, potato consumption and demand in Thailand far outstrips domestic production (USDA, 2004). For example, in 2005 the total output was about 97,410 tons, while demand totalled 165,000 tons (Office of Agricultural Economics, 2006; Department of Customs). Thus, imports accounted for 41 per cent (Table 3.1).

**Table 3.1 Demand for potato in Thailand and imports (thousand tons)**

| | Domestic production[1] | Import[2] | Total demand | % domestic production to total demand | % potato imports to total demand |
|---|---|---|---|---|---|
| 1996 | 65.14 | 25.39 | 90.53 | 71.95 | 28.05 |
| 1997 | 89.55 | 28.45 | 118 | 75.89 | 24.11 |
| 1998 | 93.78 | 29.81 | 123.59 | 75.88 | 24.12 |
| 1999 | 90.38 | 35.4 | 125.78 | 71.86 | 28.14 |
| 2000 | 100.12 | 48.39 | 148.51 | 67.42 | 32.58 |
| 2001 | 90.94 | 43.13 | 134.07 | 67.83 | 32.17 |
| 2002 | 97.37 | 43.28 | 140.65 | 69.23 | 30.77 |
| 2003 | 86.73 | 84.77 | 171.5 | 50.57 | 49.43 |
| 2004 | 99.81 | 63.38 | 163.19 | 61.16 | 38.84 |
| 2005 | 97.41 | 67.98 | 165.39 | 58.90 | 41.10 |

Sources: [1] Office of Agricultural Economics,2006; [2] Department of Customs, Thailand: BAAC; (calculated by using quantity of fresh and processing potato)

Thailand imports potatoes and various forms of potato products from twenty-three different countries. The import value has gradually increased over the past five years from 1,250 to 1,438 million baht (40 baht = 1 US $). Fresh potatoes for consumption figures in the past three years (starting 2003) show a decline in value from 210 to 150 million baht. Values for seed potato imports seem to remain relatively stable. Potato starch is a notable item; its value reached 561 million baht in 2005 (see Appendix,

Table B). Potato starch and inulin are important ingredients for the snacks industry. As the demand for snacks continues growing, it is expected that imports for these items will tend to rise at a higher rate.

The five most important sources of fresh potato are England (30 per cent), Australia (28 per cent), Canada (16.2 per cent), China (9.8 per cent) and Germany (3.4 per cent). Laos has recently become the sixth largest exporter. Laotian growers are contracted by the firms in Thailand as a consequence of the ACMECS policy (a collaborative programme for countries in the Mekong sub- region).

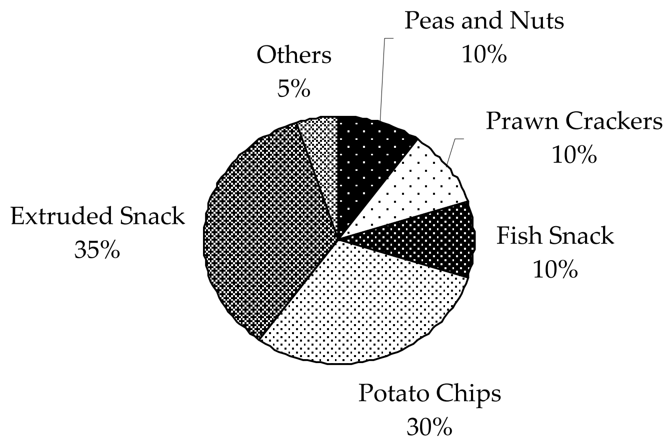
## 3.3 Potato consumption

The lifestyle of the Thai people has changed rapidly over the past ten or fifteen years, even faster than for people in other countries in the region. The expansion of modern retail stores and shopping habits as well as the widespread presence of western fast food chains in Thailand confirms this notion (Wiboonpongse and Sriboonchitta, 2005).

Initially, potato production expanded slowly as its production was absorbed by the fresh food market and there was only a slow growth in demand for processed potatoes. Following the change in consumption style, the demand for potato snacks and western fast food has increased rapidly over the past decade. This has led to a shortage of processing potatoes in the country. The growth in consumption of 'French fries' and potato crisps was estimated at 30-50 per cent per year during the 1992-1995 period. Furthermore, demand for potatoes by processing companies increased from 118,000 tons in 1997/98 to 165,390 tons in 2005 (this includes all forms of potato materials, e.g. fresh chilled/frozen, flour/meal and powder, flakes and starch). The highest record was 171,500 tons in 2003 (Table 3.1). Processing firms planned to supply potato snacks both to Thailand and neighbouring countries in Southeast Asia (USDA, 2004).

Thai people consume potato products in two food categories, i.e. snacks (chips, crackers etc.) and table potato cooked in soup and curry. The demand (Thais and tourists) for table potato approximated 15,548 tons in 2005; domestic production available for consumption was only 4,427 tons (Department of Customs, 2006). Processing potato constitutes 90 per cent of the total supply (domestic and imported). Thailand is known as one of the largest markets for snacks in the Asian Pacific and the market value of snacks increases further every year. The value of snacks consumption was US$280 million in 2003 (USDA, 2004) and reached US$300 million in 2006 (Bangkok Bank, 2007). Altogether, there are some two thousand snack brands available on the shelves. In 2002, snacks made from potato flour and granules gained the highest share of the snack market (35 per cent) followed by crisp chips (30 per cent). Other main snacks, namely peas/nuts, shrimp crackers and fish snacks account for 10 per cent each (Figure 3.2). Furthermore, it was found from the survey that 32.8 per cent of teenagers (aged 6-14 years) consume snacks every day and 53.9 per cent of Thai people enjoy snacks (Yinglertratanakul, 2003).

**Figure 3.2 Market share of snacks in 2002**



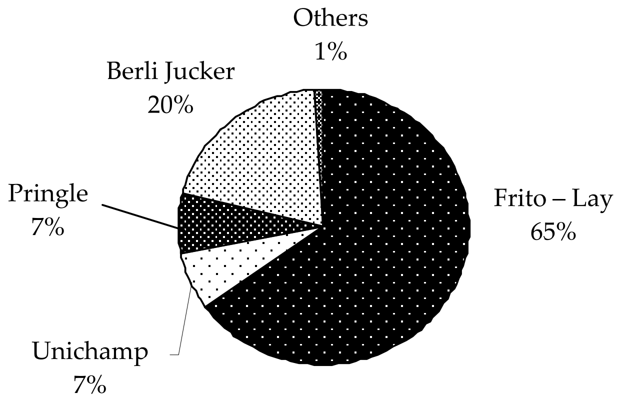

Source : USDA,2004

For crisp chips alone, 2005 figures indicated their value was as high as US$95 million. Processing firms forecast that the market for this particular product would increase by at least 10 per cent annually in 2006 and 2007. Despite attractive growth rates, average consumption per head is only 1kg/year, which is 50 per cent less than in Korea or Japan (USDA, 2004:http: Siamturakij, 2006).

## 3.4 Market share in the potato snacks business

According to the USDA (2004), there were only four large processing firms holding almost 99 per cent of the total share of the potato chip market in Thailand in 2002. PepsiCo (Frito-Lay) and Berli Jucker were the largest processing firms, with 85 per cent of the total market share and these two companies absorbed most of the processing potatoes in the country.

**Figure 3.3 Market shares of potato chip in 2002**




Source: USDA, 2004

Frito-Lay's share of the market might be underestimated. PepsiCo., the owner of the Frito-Lay brand name claimed to have achieved over 70 per cent market share of chips in the Thai market (interview with firms, 2006).

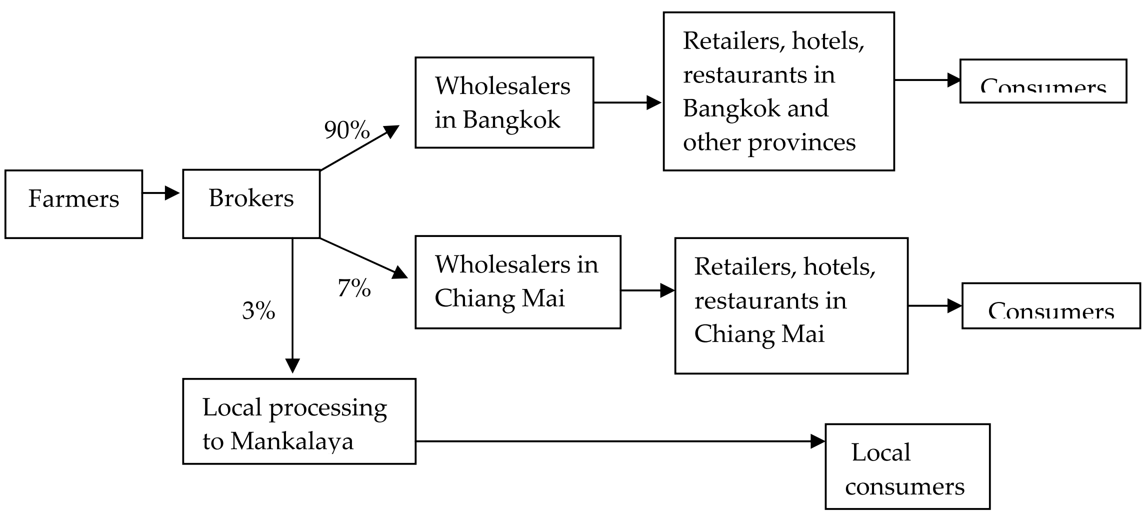
# 4 The potato supply chain in Thailand

Potato is a crop with short distribution channels. 90 per cent of the production (Atlantic cultivar) go to processing firms located in the north and only 10 per cent (Spunta) go to fresh food markets. Table potatoes for fresh cooking supplied in the markets are of domestic and import sources whereas processing potatoes are mainly from domestic production.

## 4.1 The supply chain of table potatoes

The main planting area of table potatoes is in Chiang Mai Province, which accounts for almost 90 per cent of total production. All the purchased Spunta were stocked in cold storage. The assemblers supplied to Bangkok wholesalers only when they received orders. Local assemblers were not keen to learn the sizes of demand by final buyers. Figure 4.1 illustrates marketing distribution channels indicating that Bangkok wholesalers absorb 90 per cent of table potatoes, which subsequently go to hotels/restaurants and retailers. It was revealed by the assemblers that in spite of the supply control, prices of table potatoes fluctuated from year to year depending on movements in tourism.

**Figure 4.1. Marketing distribution channels of table potatoes in 2006**

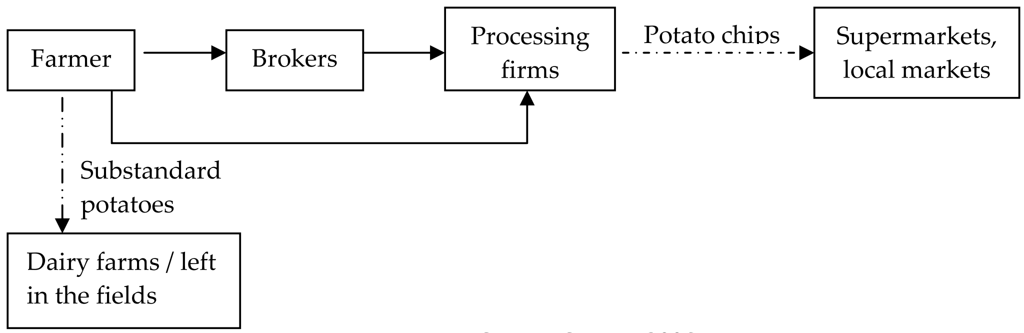



Source: Survey, 2006

## 4.2 The supply chain of processing potatoes

Brokers play a significant role in the supply chain of processing potatoes. Generally, most of the growers who produced processing potatoes were contractees who supplied raw materials to processing food industries via brokers or directly to the firms. Most of the potato chips produced by these firms were distributed to middle and high level markets such as supermarkets and convenience stores scattered across the country (Figure 4.2).

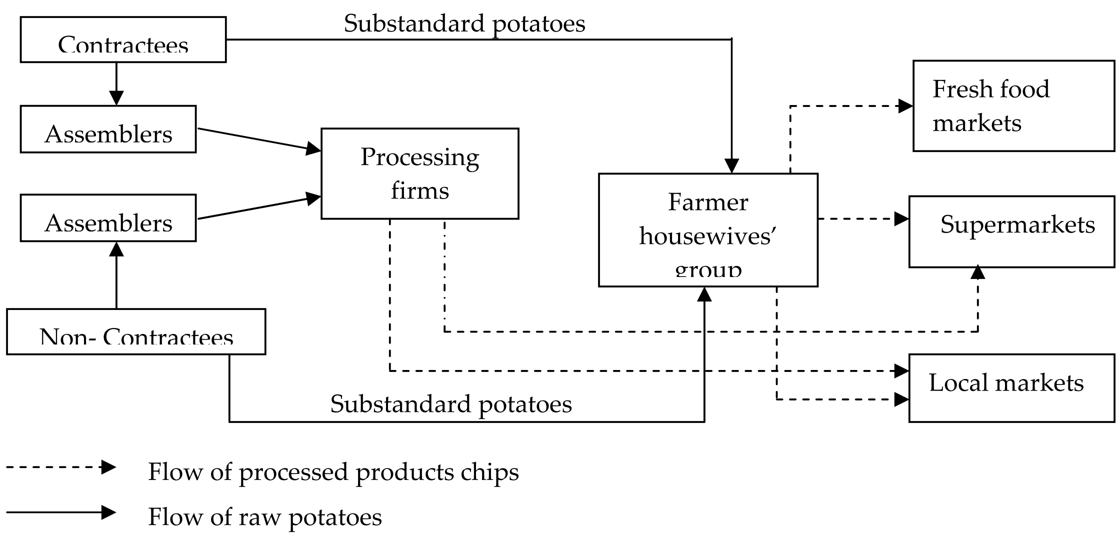
**Figure 4.2. Marketing distribution channels of processing potatoes in 2006**




Source: Survey, 2006

The survey revealed that the chain of potatoes in San Sai District is rather different from those of other areas. In 1987, when processing potatoes were first introduced into the San Sai area, farmers signed contracts with the firms. However, as observed by Wiboonpongse and Sriboonchitta (2005), marketing practices of potato growers in this district have gradually changed. Presently, 95 per cent of potato growers in this district no longer sign contracts with the processing firms. They have no contract selling, but rather, sell their potatoes to brokers at prevailing market prices (Figure 4.3).

**Figure 4.3. Marketing distribution channels of processing potatoes in San Sai District**




Source: Survey, 2006

The impact of grading has contributed to changes in the supply chain. For processing firms to purchase them, potatoes must have the following characteristics:

- size (no less than 4.50cm in diameter)
- specific gravity no less than 1.082 or FL solid no less than 17.1
- skin texture absence of peel due to premature harvesting
- no adulterated things
- no defect from nematode attack, wound from harvesting and insect attack, greenish skin, abnormal shape, serious bruise, rotten output, germinating or hollow core.

Ninety per cent of the total production from San Sai District is graded as good quality produce (large and medium sizes) and is delivered to processing firms. Over-sized potatoes are sold in the fresh food market for good prices and the under-sized ones are sold for cattle feed (1-2 baht/kg) or to the local fresh market at lower prices to become valuable domestic seed (12 baht/kg). Others of an unacceptable size (smaller than 4.5cm) are kept in cold storage for seed. Moreover, defective potatoes (accounting for some 5-10 per cent of total production) are absorbed by housewives' processing groups to produce potato chips. Thereby, value is added to substandard potatoes and there is an increase in women's employment.

# 5 Case study: inclusion of CMK group in the potato chip market

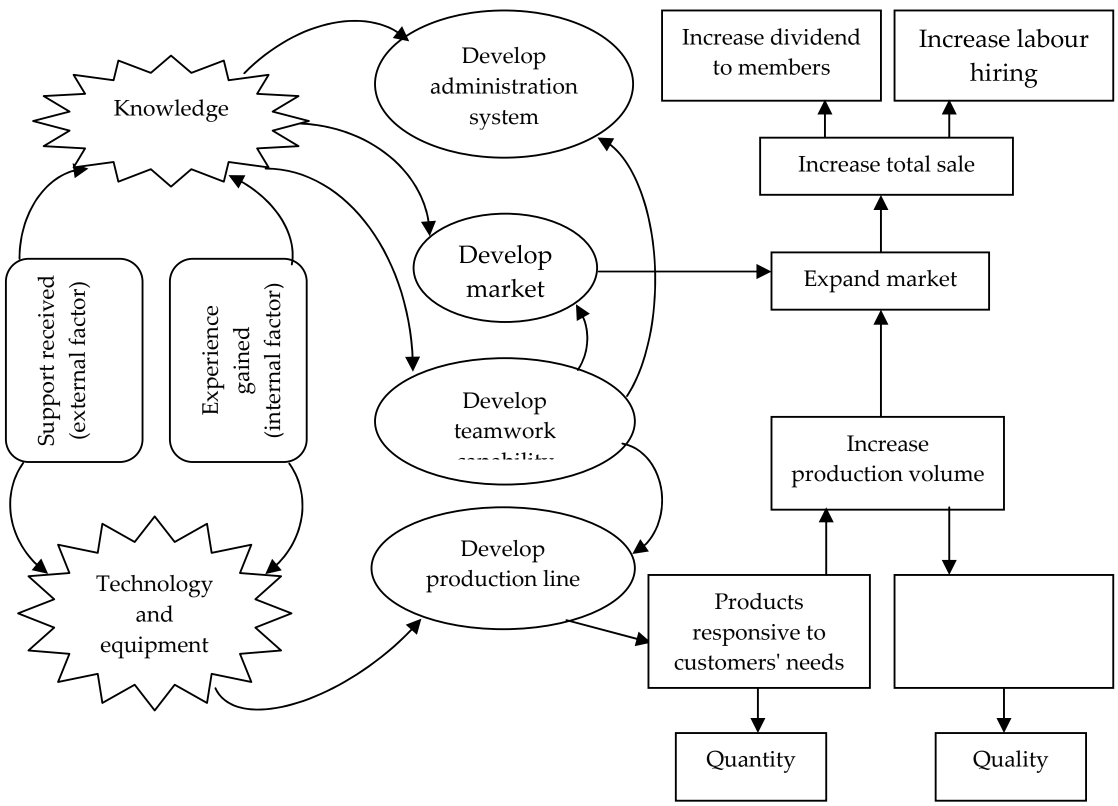
## 5.1 Background

Most of the defective produce from inappropriate harvesting was once sold as feed for cattle. Over twenty years ago, some of the defective table potatoes (Spunta variety) were transformed into dry potato slices called *munkalya*. The fried-dried potato chip made an acceptable snack and gained popularity with tourists who brought it back home as a souvenir from Chiang Mai, the main potato planting area. Currently, the defective Spunta potato is processed into *munkalya* and 'French fries' to serve local markets. In the 1990s, large processing firms were set up to produce potato chips at Lamphun Industrial Estate, only 30km away from growing areas in the San Sai District of Chiang Mai Province. This stimulated a further increase in demand for raw potatoes in this province. Since nearly all the good processing potatoes are purchased by the food processing industries, the remaining 10 per cent are distributed to fresh food markets and kept for seed. Some of the defective produce is processed into potato chips by a potato grower housewives' group.

After the economic crisis (in 1997), many policy measures were launched nationwide to accelerate local groups in order to create local employment and income. However, it should be noted that policy to support local groups to create additional value to farm produce has long been implemented. This includes the development of the so-called "Community Enterprise" which has become a specific name for registered groups under public policy in 2005. The objectives of the 2003 Act of Community Enterprises promotion are "to promote local knowledge and wisdom, generate income, encourage reciprocal help, develop management capability and develop the types of community enterprises for the local community to become self-reliant and be able to build up the strength of community enterprises, ready for trade competitiveness in the future at any market levels as well as for transforming the community enterprises into higher level business operators". This Act has been implemented since 2005 and has had implications for the CMK group.

The housewives' group of Chedi-Mae Krew (CMK) is a community enterprise, which was set up to produce potato chips by using substandard potatoes, the quantity of which has increased with the expansion of total production. The group provides an alternative to potato growers to a gain higher income selling defective produce. Substandard potatoes are sold to the group at 2-5 baht/kg instead of the 1-2 baht/kg when purchased by dairy farms. The group includes 40 (later 42) members; each holds at least one share of 100 baht. The initial capital of the group (worth 71,100 baht) enabled them to invest in production equipment and raw materials (Wiboonpongse et al., 2005). CMK expanded its function to provide saving and credit activities. This in turn allowed CMK to purchase more defective potatoes. CMK is one of the most successful groups in the San Sai District and so it is selected to represent a business model for community enterprise. The keys to the success of the group are their strong business management and product development as well as the continuous support in terms of technology and knowledge from the government.

**Figure 5.1. Group development pattern**




Source: Survey 2006

The key factors enabling the groups to become successful in the production and marketing management are knowledge, technology and equipment. Consequently, the group has gained its strength in all its administration, marketing, production, and personal development aspects. This in turn has led to a capability to produce products that satisfy customers and a situation of continuous market expansion. The groups' roles in providing greater employment opportunities, greater dividend to members and buying defective potatoes has made a contribution to the community as a whole.

Capital and equipment are scarce in almost every community enterprise. CMK has been fortunate to receive continuous support (in terms of budget and production equipment) from various government agencies since the outset of its operations as a community enterprise. These supports are the main resources in use at present.

The supporting agencies are:

- The National Region Industrial Promotion Centre for production tools and equipment
- The Department of Agricultural Extension for production equipment and budget
- The Department of Cooperatives Promotion for aluminum foil packages and related equipment
- The Chiang Mai Provincial Agricultural Office for budget
- Mae Fak Tambon Administration Organization for budget
- Chiang Mai University for longan-drying oven for grease reduction in fried chips
- District Agricultural Office for cleaning and small slicing machine

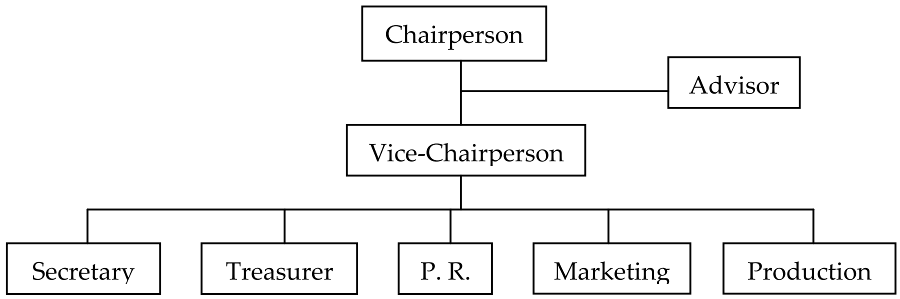
One might argue that the substantial support given by the government agencies to the CMK group could explain its relatively strong progress and success. The fact is that, in addition to this support from general government policies, local government agencies generally give priority to the more promising community groups when appportioning support in order to generate the desirable programme outputs.

Furthermore, in addition to the existing capabilities and experiences of the group executive committees members, the knowledge and experience gained in the process of ongoing business administration and production management have contributed to the smooth and uninterrupted growth process of the group as described in greater detail below.

## 5.2 Management

As a group registered under a policy aimed at accelerating income to strengthen the local community, CMK was required to have a clear organizational structure. The Board of Committee comprises a chairperson and relevant committee members as illustrated in Figure 5.2.

**Figure 5.2. Organizational structure of the CMK committee**




Source : Wiboonpongse et al., 2004

CMK is a well-structured organization. Each committee member is assigned to the right job and thus is able to handle their tasks proficiently. According to the survey by the Sriboonchitta et al., 2004, only 10 per cent of the community enterprises were found to have a Board of the Committee in which committee members performed the functions they were responsible for correctly.

Unlike most other housewives' groups, CMK's committee members were able to handle their own responsibilities rather well. This is the strength that helps alleviate the heavy workload of the group leader. The leader's particular responsibility to the CMK group has been the overall planning and monitoring work plan, coordinating with government agencies and attending local meetings.

## 5.3 Human resources

The management capability of the group leader and committee members is the key factor in the success of the group. The chairperson, Mrs. Boukham Wipasa, completed only four years of formal education. Her major occupation is farming. However, Boukham has played several roles in the community. She has been involved as the chairperson of the "Housewives group of Mae Fag sub-district", committee member of the "Sub-district Technology Center" and treasurer of the Upper North OTOP Network (covering eight provinces). In addition, the chairperson and all committee members have had experience working at village level administration, from being members of such committees as the Housewives' group, Village Found, and Sajja Saving Group. Indeed, such activity in the various local organizations provides crucial social capital for the formation of the CMK business and operation network.

Mr. Wipasa, the leader's husband and advisor to the group, has played significant roles in marketing and advising the group. His background on cooperative management (from being the chairman of the Potato Growers Cooperative and a member of the National Cooperative League of Thailand) provided business orientated attitudes, concepts and a progressive approach to the group management.

The committee members attended anything between four and thirteen years of formal education; however, they have frequent opportunities to gain knowledge from government agencies, thus enhancing their ability to handle their responsibilities rather well. Furthermore, the group frequently seeks technical advice from local universities and government agencies on the following areas:

- The Northern Region Industrial Promotion Center on food processing knowledge;
- The Department of Agricultural Extension on food processing and group administration;
- The Department of Cooperatives Promotion on accounting knowledge;
- The Department of Community Development on accounting and business planning;
- Chiang Mai University on the knowledge about accounting, marketing, and administration;
- Mae Jo University on production for food standard and safety.

## 5.4 Production

One instrument for CMK to be able to produce good quality potato chips from rejected potatoes is the continuous product development by the group as well as knowledge and technology support from the government. The group has received support mostly in terms of production equipment and packaging machinery (approximately 1.1 million baht in cash and loans). CMK invested about 0.28 million baht out of its own pocket, which accounts for only 19 per cent of the total investment (Wiboonpongse et al., 2005). It should be noted that the good access to government agencies is attributed to the social and business network of Mrs. Baukham's husband.

The group can produce products in response to customers' needs in terms of both quantity and quality by organising the production plan on the basis of historical purchase orders and total sales each month. The output supply is fairly consistent with actual demand resulting in the absence of over-stocking problems. The products delivered to customers are therefore recently produced. This is important for the competitiveness of the group.

The group members working in the processing activities have experience and skill in performing their functions and can replace each other when necessary. Therefore, the production process can be run efficiently without a controller. In 2003, the group produced crisp chips for only eight months from January to August, because there is no local potato output in the remaining months and the group was not able to obtain enough potatoes to keep in storage for use when there was a shortage of raw materials. However, in 2006, the group managed to produce crisp chips all year round because it solved the problem by experimenting with storing potatoes at temperature of 25° C and the raw material was still of a suitable quality for processing.

Apart from freshness of the products, flavours of crisp chips are also important. This is why the group has given priority to the source of flavouring agent by buying the ingredient from the same source as the large processing firms to ensure product flavours come close to those of the market leaders, but with a slight difference. The selected flavours were the ones that the group had identified from its survey to be the favourite choices among its consumers. Then the group signed an agreement with the flavouring agent for them not to supply the same flavours to other processing firms.

## 5.5 Production problems and solutions

The group used simple equipment and technology in its production process as the equipment was an input support from the Provincial Cooperatives Promotion Office and the know-how on potato chips processing was provided by the Department of Agricultural Extension. Consequently, it has to face the problem of low technical efficiency of the equipment and the lack of appropriate production knowledge to turn out quality products. Furthermore, being a small producer with limited financial capacity, the group is not able to make any reasonable investment in certain industrial equipment that could ensure good quality products as affordable as those made by large firms. However, CMK has dealt with these problems rather well by modifying the locally available tools and production techniques to compensate for the absence of modern equipment and technologies. Local government agencies, such as Chiang Mai University and Mae Jo University have conducted relevant research on technical adaptation of simple equipment.

Specifically, the problems and solutions have been addressed as follows:

- The problem of inappropriate processing technique and inappropriate packaging that led to short product shelf life was solved by modifying the longan-drying oven (supported by Chiang Mai university) for grease reduction in fried chips.
- Manual peeling and slicing was labour intensive and time consuming, thus leading to high costs and production limitations. CMK sought support from the District Agricultural Office for cleaning machines and small slicing machines to improve efficiency and product uniformity.
- A lack of know-how in storing raw materials was responsible for the rooting of more than 50 per cent of the raw materials and hence the higher cost of

production. Potatoes have to be stored at appropriate temperature levels to minimize perishability. However, the group had too small a volume of raw potatoes to rent a cool storage room so it had to keep the potatoes at room temperature, which resulted in a storage loss of 50 per cent. In 2005, the group tried to solve the problem by trial-and-error by storing potatoes in a room at 25°C and found this could reduce the rotting and extend the storage life of the potatoes. In 2007, CMK will experiment with storing processed potatoes instead of raw materials to reduce the economic loss.

## 5.6 Product

The group processes potato chips in a simple processing plant; however, consumers consider its products to be of good quality. In 1997, CMK began with only two products; dried potato called *mankalaya* and crackers produced from Spunta variety potatoes. The production length was limited to three or four months during the hot season since dried potato requires sun drying. In the following year, with support from the District Agricultural Office, the same form of chips as produced by large firms was processed from rejected potatoes.

The group initially sold chips unbranded in simple plastic bags in bulk (0.5-5kg per bag) for local markets within the district. After joining the exhibitions and fairs organized by government agencies in Bangkok and other provinces, CMK realized its market potential and observed and learned from other more advanced groups' products. CMK reduced packaging to serving sizes with a sticker of the group's name on as its brand name. In 1999, CMK's crisp chips became popular at the district level and the original flavour chip was followed by various other flavours to catch up with the change in consumers' preference as influenced by large firms. Over the past five years, the group has improved its products and packaging substantially. Packages and packing were designed to be attractive and distinct from other similar products. Products and packages are also diversified to serve different target consumers.

In 2004, the group implemented the brand "Chip Chip" and foil packaging in fancy colours and design, was used to contain nitrogen to prolong the shelf life of the products. The necessary equipment and foil packages were provided by the Department of Cooperatives Promotion.

The group has pushed to develop its products continuously. Its products now come in salt, chicken, Thai spicy, seaweed, popcorn and b-b-q flavours and it increased its products lines from two at the outset to more than ten at present, which are packed in various packaging forms. In 2006, the brand "Chip Chip" was discontinued since it replicated an existing brand. The new brand of CMK became "Merry" and the chips are in the same category as those of the large firms and available on shelves in mini-marts and snack-bars in the local stores. However, the group realized that the cost of attractive packaging was too high and they could not compete with the large firms by using this strategy.

Presently, the group produces a variety of flavours and packaging of its products to serve different markets (Table 5.1).

**Table 5.1 Products distributed to the markets**

| Type of packaging | Weight | Market |
|---|---|---|
| Simple plastic bags | 0.5 – 5 kg | wholesale in village and other provinces |
| Simple plastic bags with its brand | 60g, 40g, 20g | wholesale and retail in village and other provinces |
| Aluminum foil with colourful bags | 40g, 20g | cooperative shops in universities and supermarkets |
| Simple plastic bags with its brand | Packed to order | wholesale in village and other provinces |

Source: Survey, 2006

## 5.7 Raw materials

CMK purchased the potatoes rejected by other processing firms from members, brokers and the large firms to use as raw material. Such potatoes were rejected due to abnormal shape or poor harvest handling, usually damaged and unstorable for seed. However, the characteristics related to fried chips quality such as sugar and flour contents made them suitable for potato chips processing. The group has the advantage of being located close to the cultivation area and other processing plants in order to access the raw materials.

In 2004, the group bought fifty tons of substandard potatoes, however half of all purchased potatoes were lost because of improper storage. As mentioned earlier, the group was successful in preserving potatoes at 25°C in cool rooms and this helped prolong the storage life of raw materials. Thus, in 2006 CMK processed 200 tons of substandard produce, which accounted for 35 per cent of total substandard potatoes in Chiang Mai Province. The value added to defective potatoes in 2006 was about 600,000 baht and it is expected to increase by 50 per cent in 2007.

## 5.8 Employment

The group employed its members to work in the processing plant. The employees earned a salary as well as other welfare benefits from the group. In 2004, thirteen members were employed at 120 baht per day to work once a week. After the market expansion in 2006, CMK hired five permanent employees working five days a week and increased wages to 150 baht per day. Thus, income distributed to members increased from 74,880 baht in 2003 to 195,000 baht in 2006.

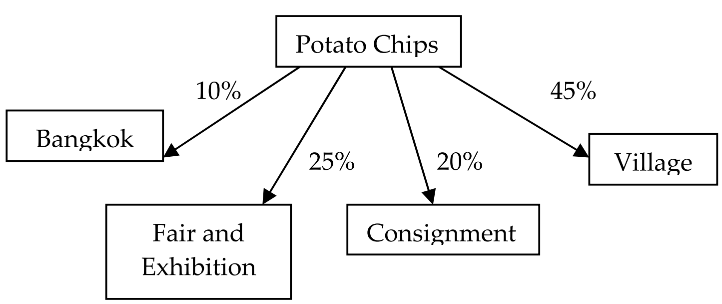
The group has had no problem securing labour inputs when needed because the local villagers are generally farmers and they can spare some time to work for the group when the permanent employees require back-up.

## 5.9 Marketing

Pricing and niche marketing are the key strategies to market expansion. At the initial stage, the target customers were students and local people in the community. Therefore, the products were packed to order in simple plastic bags and sold to schools and customers in the villages for traditional ceremonies such as weddings, New Year and ordainments. While other groups aimed only at local markets (within the district), CMK improved its packaging and extended its market boundaries. By joining the exhibitions and fairs organized by government agencies in other provinces, the group could expand its market to other provinces, especially to Bangkok.

Market channels of the group have changed since 1997. The group has expanded its market to other provinces and increased total sales dramatically. The share of total sales to other provinces increased from 10 per cent in 1997 to 35 per cent (Bangkok and exhibition) in 2003, while 65 per cent of the products were marketed in Chiang Mai Province (village and consignment). The main customers in the villages were students, and most products sold in this channel were packed in simple plastic bags with brand name (Figure 5.3).

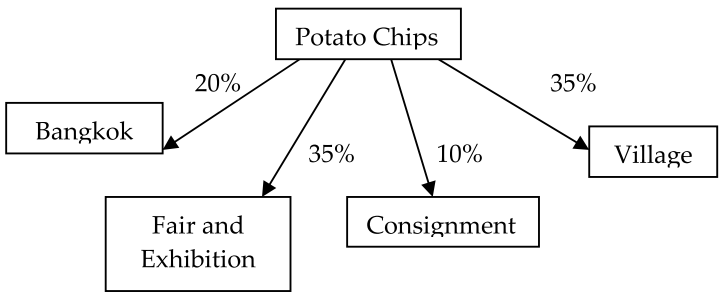
**Figure 5.3 CMK market channels in 2003**




Source : Wiboonpongse, 2004

In 2006, the group extended its market boundary to other provinces as well as increasing total sales. Total sales increased from 317,380 baht in 2003 to 1,080,000 baht in 2006 and the portion of sales to other provinces has increased by 45 per cent since the outset of the project. CMK's main market channels are still in the villages, which account for 35 per cent of total sales; however, the percentage of sales to Bangkok and to fairs and exhibitions in other provinces has increased by 10 per cent since 2003 (Figure 5.4).

**Figure 5.4 CMK market channels in 2006**




Source : Survey, 2006

CMK plans to expand its production in order to supply a big discount chain store and so penetrate the national market. First, the company will improve its processing plant according to the Good Manufacturing Practice standard (GMP) and install automatic processing equipment to ensure uniformity of product quality.

Along with the production expansion, CMK plans to improve its marketing management by hiring marketing personnel and adopting more aggressive marketing strategies.

CMK gains advantage from the increase in demand for potato chips influenced by advertisements from large firms. Thus, the group produces similar products to catch up with the demand led by famous brand names.

CMK's current market strategies are as followed:

- Advertisement of large firms has contributed significantly to the popularity of potato chips especially among children and teenagers. Therefore, the group has focused on students in schools and universities to expand its market. The main customers of CMK's products are:
  i. Children and teenagers in schools,
  ii. Students in universities and colleges in Chiang Mai Province,
  iii. Local markets and fresh food markets in Chiang Mai and some provinces in the north and Bangkok;
- The group targets middle and local market segments. School children and teenagers are major consumers. However, some of its products have been supplied to the upper markets to reach wider consumers such as cooperative shops in universities and special space in supermarkets assigned for local cottage products - this opens additional outlets CMK;

- The prices of the group's products are set slightly lower than those of the famous brands while net weights are greater to compete with the famous brand names;
- For production expansion, in the near future parts of the products will be made-to-order for modern supermarkets under the latter's brand names.

## 5.10 CMK as an alternative for farmers' participation in the supply chain

CMK is a potato growers' housewives group that was set up as an alternative for small growers to increase income from the substandard potatoes as well as to become a small enterprise participating in the potato supply chain. The group offers benefits for potato growers as well as participating themselves in the potato supply chain.

### 5.10.1 Benefit to the growers

- Financial gain received by the members from selling damaged/defective and unacceptable potatoes (both Atlantic and Spunta varieties) at 2-5 baht per kilogram.
- The incremental value of 600,000 baht to the otherwise price of defective potatoes as animal feed means a significant contribution by CMK to both member and non-member growers incomes.

### 5.10.2 Inclusion of CMK in market dynamics

- Although two large firms hold 90 per cent of market share for potato chips in Thailand with a 25-30 per cent annual growth rate, CMK has increased its sales from 0.3 million baht in 2004 to 1.08 million baht in recent years.
- Although CMK originally targeted local and lower level markets, it could get further involved in market dynamics by supplying products to the same target groups as the large firms (as shown in Figure 4.3).

## 5.11 Adaptation of CMK to market dynamics

CMK has always been responsive to market trends, as seen since its outset producing *mankalaya*. While *mankalaya* has declined in its popularity while crisp chips have come into greater demand, followed by an increase in production of Atlantic potato, CMK has demonstrated its ability to adapt to market changes (as summarized in Table 5.2).

**Table 5.2. Implication of changes in supply chain for defective potatoes at the CMK housewives' group**

| Period | Supply chain event | Product | Market | Problem | Solution | Innovation events |
|---|---|---|---|---|---|---|
| 1990s | Most of the defective potatoes were purchased by dairy farms at 1 –2 baht/kg. There was a need to make better use and increase the value of defective potatoes. | | | | | |
| 1997 | In 1997, forty potato growers' wives formed a group (CMK) to process their defective potatoes. The committee was formed with specific responsibilities assigned to appropriate persons. | • *Mankalaya* (dried potato)<br>• Potato snacks packed in simple plastic bags | • San Sai sub-district | • Production length was limited to 3-4 months during hot season since m*ankalaya* needs sun drying. | • Try to expand production | • Use Atlantic variety to process non dried chips. |
| 1998 | Started to process chips like those produced by large firms (using Atlantic variety) | • *Mankalaya* (dried potato)<br>• Potato chips<br>• Potato crackers<br>• Packed in good branded plastic bags | • Expand market to local school children. | • Inappropriate processing technique led to short product shelf life. | • Need to install new frying equipment. | • Modify longan-drying oven for grease reduction in fried chips. |
| 1999 | CMK's crisp chips became popular at the district level. Natural-salted chip was the original flavour of the group's product. | | • Expand market to Bangkok and other provinces by joining exhibitions/ fairs. | • Manual peeling and slicing are labour intensive and time consuming.<br>• No raw material off-season. | • Requested peeling and slicing equipment.<br>• Purchased substandard potatoes from other districts. | • To improve efficiency and product uniformity, CMK sought support from the District Agricultural Office for cleaning and slicing machines. |
| 2000 | Product seasonings were available from a local company | • *Mankalaya* (dried potato)<br>• Potato chips | | • Limited product choice to customers. | • Added two more flavours. | • Two more flavours : chicken and b-b-q were added to crisp chips. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | salt, chicken and b-b-q flavours<br>• Potato crackers<br>• Plastic branded packaging. | | | | |
| 2000 | CMK planned to expand its retailing. | | | • Lack of know-how on storing raw material to keep good quality of chips. | • Stored potatoes at room temperature with 50 per cent storage loss. | • CMK decided to brand its products "Chip Chip" in the hope of maintaining and increasing share in local markets |
| 2001 | Gaining consumers' confidence in product quality is required for certain food categories. | | | | | • CMK improved its production practices to meet standards for certification. |
| 2004 | Increasing demand for chips/ snacks leading to competition among international brands. Products of these firms were also available in local schools and local markets. | | • Supply to shopping malls and stores in two universities in Chiang Mai Province. | • Short shelf life due to inappropriate packaging.<br>• Chips were damaged during shipping. | • Used new foil packaging and added nitrogen to prolong shelf life. | • CMK implemented own brand. "Chip Chip" was designed with aluminum foil packages similar to international brands but targeted at teenagers. CMK obtained subsidy from the Department of Cooperatives Promotion to cover high costs of implementing new packaging. The subsidy (for 300,000 packages and related equipment) was worth 600,000 baht |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2004 | Strong competition between two large firms using product differentiation strategy led to a great variety of new flavours. | • *Mankalaya* (dried potato)<br>• Potato chips salt, chicken, Thai spicy, seaweed, popcorn and b-b-q flavours<br>• Potato crackers<br>• Plastic packaging with brand. | | | | • CMK adjusted to market trends by adding two new flavours. The group also changed its brand to "Merry" as "Chip Chip" was similar to another existing brand.<br>• Improve quality and design of plastic bag with brand.<br>• Use new foil packaging. |
| 2004 | CMK responded to the change in chip market by using foil packaging and aiming to sell in the same segment as the large firms. | | | • Cost of packaging was too high.<br>• Unable to survive in modern stores. | • Modified packaging | • Focus on middle level market segment<br>• Lower packaging cost and price at competitive level |
| 2005 | As a consequence of the expanding market, CMK hoped to extend its processing operations beyond three months | | | | | • CMK leader conducted simple storage experiment. It succeeded in storing raw material up to four months in an air-conditioned room at 20-25°C. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2005 | CMK becomes a learning centre at provincial level due to its success in value creation for potatoes, one of the main crops of northern Thailand | | | | | • CMK attempted to increase production size and keep costs at a level comparable with large firms. Thus, CMK absorbed more raw materials from non-members in the district. Inputs rose from 6 tons in 1997 to 200 tons in 2006. |
| 2006 | The group's income reached 1,080,000 baht and raw materials increased by 400% within two years (from 50 tons in 2004 to 200 tons in 2006.) | | | | | |
| 2006 | CMK plans to expand its markets and is in the process of hiring marketing personnel. | | | | | • Again, CMK will receive new equipment support from the Chiang Mai Provincial. |

## 5.12 CMK's production costs and returns from potato chips

Production costs and returns figures in 2003 show that the net return for one kilo of finished product varied substantially. The highest profit is from *mankalaya* (88.84 baht/kg) but this product is only marketed at local/village level (Table 5.3). The 300g pack crisp chip (plastic bag with brand) enjoyed the largest share of returns of the crisp chips produced from the Atlantic variety (at 47.00 baht/kg). The 20g crisp chips in the most modern foil packaging earned by far the lowest profit (22.5 baht/kg). It is difficult for a small enterprise to expand its market at the high end. Despite having no advertisement costs, the wholesale price of 3.75 baht/20g was considered too high to compete with those of large brand names. Economy of scale seems to dominate over other advantages of small producers, even for a relatively advanced community group like CMK.

**Table 5.3. Costs and returns from chip potatoes**

| Item | Total cost | Wholesale price (baht/unit) | Net return/unit | Net return equivalent |
|---|---|---|---|---|
| Crisp chip | 35.89 | 50 | 14.11 | 47.00 |
| Crisp chip in foil package 20g | 3.30 | 3.75 | 0.45 | 22.5 |
| *Mankalaya* (non-fried) 1kg | 31.16 | 120 | 88.84 | 88.84 |

Source: Wiboonpongse et al. 2005, interview 2006

## 5.13 Is CMK excluded from supermarket channels?

CMK products appeared on the shelves of supermarkets in two different ways: on special shelves arranged for OTOP[c] products; and on the shelves organized by the supermarket at BIG-C (seven-day period and only three periods are allowed for each group per year). This spot allows the group to earn 4,000-7,000 baht per day. In general, once a group's products are accepted for putting on shelves, there is an open opportunity to continue supplying through this channel.

As producer of an OTOP product, CMK could either make a direct link with supermarkets or via collectors (or vendors). The stores will normally look for desirable products (by procurement unit) and arrange to contact the OTOP producers. There was no entrance fee charged to enter the supermarkets but community groups need to follow standard agreements and procedure namely:

- Consignment systems

[c]OTOP stands for "One Tambon One Product" (sub-district product representatives) and has been part of the national programme of the Thai government since 2001 to promote community groups' products and local wisdom for acceptance by national and global markets.

- Payment period of 45 days
- Commission charge at 20-30 per cent of sale value
- Products to be replaced once a month

CMK also sold wholesale to vendors who placed the CMK foil package chips in supermarkets in the north and northern regions. In the supermarket CMK dealt with, the products were sold in both foil ands nice-looking plastic packages. CMK did not find this channel preferable. The group found several issues problematic. Five major problems are listed below:

- The credit term of 45 days was too long, causing cash flow problems;
- The commission rate was too high;
- CMK products were not well known and incomparable to Frito-Lay®, Testo®, and other famous brand names, thus there was a low rate of turn-over;
- Expired products added to high unit marketing cost;
- Being a small brand, CMK products were placed at non-attractive shelf positions.

Another special centre of OTOP products is located in a shopping mall of the North Village in Central Airport Shopping Mall, Chiang Mai City. The group uses this place to retail as well as publicize its brand.

## 5.14 Factors influencing the success of CMK

Before the operation of the CMK group, the Chiang Mai Provincial Agricultural Cooperative had already established a small plant to process potato products but this failed due to marketing problems. Comparatively, CMK has been successful in keeping its production and product development up to date with market dynamics, due to the following reasons:

- Keys to the success of the group to be included in the potato supply chain were the ability in management, product development and marketing management as well as the support from the government agencies;
- Apart from government support in general, the success of the group was attributed to the leader’s ability to achieve better access to support and by personal performance in management and marketing;
- CMK took the opportunity to promote and expand its market by joining the meeting, fairs and exhibition organized by the government agencies in Bangkok and other provinces;
- The group realized its market potentials and observed and learned from other advanced groups’ products;
- The group chose the right market segments. Niche marketing is an appropriate concept as long as the group can catch up with trends influenced by large firms;

- The group realized that the modern supply chain does not have much room for small-scaled producers due to the economy of scale in marketing activities, especially placing and advertising. Therefore, they focused on the lower level market, which could absorb most of its products;
- Apart from the price competition with the large firms in the market, the group realized that the taste of potato chips is an important factor influencing the consumers' decision to buy a product. Therefore, the group purchased powdered flavouring from the same source as the large firms to produce similar products in order to keep up with consumer preferences.

# 6 Recommendation for small-scale producers

1. Capacity building for human resources in management is important both in business aspects as well as in organization (especially when there are no strong personal leadership capabilities).
2. With growing concentration in the processing and retail sectors, small scale producers (farmers) should be taught to enhance their abilities to search for knowledge on product development and make the best use of farm produce.
3. Appropriately designed packaging for target segments is an important concept, which is currently lacking and needs to be emphasized.
4. Certain marketing events organized by the public sector are fruitful for the publicity of small producers in participating in the broader market.
5. Ongoing public sector support up to an optimal time/level is necessary to help a community group to build strong foundations and proceed at its own pace.

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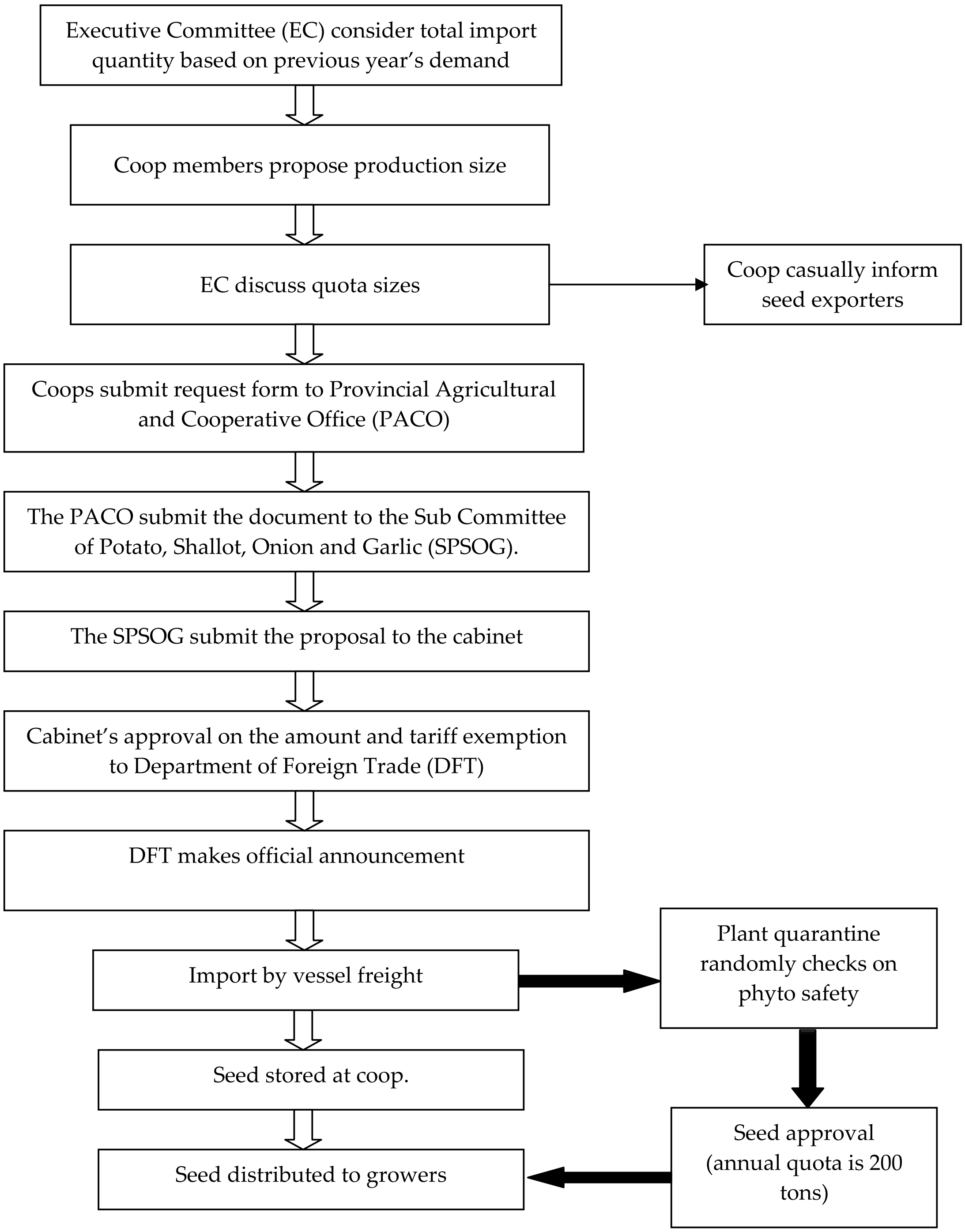
# Appendix

**Figure A. Import procedure of table potato seed**




Source : Interview, 2006

**Table B. Import values of potato and products (million baht)**

| Year | Potatoes, fresh or chilled | Fresh potatoes | Seed | Flakes, granules and pellets | Flour, meal and powder | Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen, potato | Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, frozen, potato | Uncooked or cooked by steaming or boiling in water, frozen | Potato starch inulin | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 0.00 | 0.00 | 123.23 | 33.16 | 21.07 | 299.13 | 306.24 | 0.15 | 468.37 | 1,251.35 |
| 2002 | 0.00 | 0.00 | 116.32 | 36.13 | 39.02 | 278.23 | 315.83 | 0.01 | 384.81 | 1,170.36 |
| 2003 | 13.57 | 209.60 | 131.00 | 26.65 | 26.97 | 216.56 | 374.90 | 0.27 | 428.19 | 1,427.70 |
| 2004 | 15.71 | 194.64 | 135.74 | 36.94 | 31.94 | 198.72 | 441.39 | 0.32 | 471.36 | 1,526.77 |
| 2005 | 28.18 | 151.01 | 137.66 | 33.16 | 13.82 | 4.96 | 508.39 | 0.06 | 561.02 | 1,438.26 |

Source: Department of Customs, 2006
Note : 40 baht=1US$

**Regoverning Markets**

Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets. The programme is funded by the UK Department for International Development (DFID), the International Development Research Centre (IDRC), ICCO, Cordaid, the Canadian International Development Agency (CIDA), and the US Agency for International Development (USAID).

**Innovative Practice**

Innovative Practice is a series of case studies from the Regoverning Markets programme providing examples of specific innovation in connecting small-scale producers with dynamic markets at local or regional level. Based on significant fieldwork activities, the studies focus on four drivers of innovation: public policy principles, private business models, collective action strategies by small-scale farmers, and intervention strategies and methods of development agencies. The studies highlight policy lessons and suggest working methods to guide public and private actors.

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