

The Roles of Contract Farming in Agricultural Transition in Thailand.

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ABSTRACT

This paper reviews the past performances of contract farming (CF) in Thailand, and presents the results of the recent case studies in Chiang Mai where CF has been implemented by the increasing numbers of food processing companies.

The findings reveal both success and failure of CF in food production and processing industries. The recent evidences show that CF can be a promising vehicle for intensification of agricultural production and expansion of agro-industry. The successful firms could obtain improved quality and assured supply of raw materials. But some reversed effects were also observed, even when farmers had received technical know-how, inputs on credit and stable income under the CF agreement. Several requirements have to be met to ensure success of CF which would benefit both farmers and agro-industrial firms. These include coordination and supports of local authorities such as agricultural extension agents, local administration officers and Bank of Agriculture and Agricultural Cooperatives.

Key words : agribusiness, contract farming, agricultural transition, Thailand.

Introduction

The National Economic and Social Development Plans implemented for over three decades have transformed Thai agriculture from basically rice based to more diversified production systems. The adoption of the Green Revolution approach has doubled the productivity of irrigated rice, and thus contributed to the increased export volume of 5 million tons. The build-up of infrastructures (such as road network, transportation facilities, irrigation expansion, electricity, financial institutions and public research organizations) have also helped develop agricultural diversification, providing opportunities for more cash crops to be incorporated into the changing farming systems. In the early periods of the National Economic and Social Development Plans, expansion of cash crops included cassava, sugar cane, kenaf, maize *etc.* in the dry land agricultural systems, and followed by soybean, peanut, mungbean in both dry land and irrigated ecosystems.

However the last 10 years, since the implementation The Sixth National Plan, has witnessed the increase investment in the private-led integrated agricultural development. New cash crops, livestock and fisheries innovative production practices and expanded exported markets have been introduced and developed by the private agro-industrial firms to capitalize favorable climatic conditions, better natural and human resource endowment, and well interwoven infrastructures for intensive industrial agriculture development. Various forms of production systems and marketing arrangements

have been augmented to provide viable agribusiness where production efficiency and product quality are the primary concerns.

Economically, Thailand had enjoyed the rapid economic growth in the past two decades especially during 1985-94. The GDP increased from 1.05 billion Baht (1985) to 2.5 billion Baht (25 Baht = US \$1) in 1991. The rapid growth was brought about by the nonagricultural sectors. During 1977 to 1994, the proportion of agricultural produce declined from 21.39 % to 11.06 % of GDP. For the same period, the growth of agro-industry was approximately 10 % per annum.

Agro-industry, as a subset of nonagricultural sector, held the constant proportion of 14 % of GDP. The sector grew rapidly in concert with the whole nonagricultural sector at 10 % per annum.

The increase of export value of agro-industrial products in 1995 was 21.5 % which was almost doubled the growth rate of other industrial sector (13.7 %). Seven out of the top 10 agro-industrial products were food products which accounted for 80 % of the total export value of the sector, the remaining 20 % were attributed by rubber, animal feed and kenaf products, (NESDB, 1995).

The rapid growth of the agro-industry was due to government policy to promote value added industries beginning in the 4th National Economic and Social Development Plan (1977-81). As an example, the policy had changed export of castor bean to castor oil.

In food industry, the processed food, was initially produced for export markets e.g. canned fish, pineapple and tomato products. The canned vegetables produced in the 70' s were mostly export under

foreign brands. The agricultural produce introduced for food industry purpose in the early stage was tomato to meet the increasing demand of fish canneries.

As the world market became more competitive, processing firms placed top priority to the product quality. Furthermore, expansion of business depended heavily on reliability of supply of good quality raw materials at reasonable cost. Contract marketing and contract farming had been employed to serve these purpose for some firms. Glover (1992) stated that, "Of all the countries in Asia, Thailand probably has the most extensive experience with contract farming, in the widest range of crops. Contract farming is a key element of the Thai government 's development plan, reflecting a strategy of private-led integrated agricultural development, ...".

The contract arrangements had been increased notably after 1990. Several new crops were produced under contracts including jasmine rice, organic rice, prawn, new kinds of vegetables for frozen industry and fruits *etc.* All regions in Thailand had more experience of contract arrangement which was expected to benefit both farm and agro-industrial sectors.

This paper intends to present government supporting policies, experiences on contract arrangements (marketing and farming) with emphasis on Chiang Mai as case study for Northern Thailand. The past evidences will be incorporated to show development of contract arrangement and its performances in agricultural transition conditions.

Government policy support in contract farming

The agricultural development policy in the Sixth National Economic and Social Development Plan (1987-91) included the guidelines for development of agro-industries. Among others, the objectives were to promote export and import substitute commodities through improving quality and management system, to assist agro-industrial plants in transferring appropriate technology to farmers and to support farmers in production planning so that consistent supply of high quality raw materials could be met the requirements of agro-industrial plants. Manarangsan and Suwanjindar, (1992) concluded that the guidelines were in many respects similar to contract farming.

To augment the above guidelines, the Thai government developed the so called “Four-Sector Co-operation Plan to Develop Agriculture and Agro-industry” (4-sector plan). Under this plan, agro-industrial firms, farmers, financial institutions (Bank for Agriculture and Agricultural Cooperatives, BAAC) and government agencies were to work together. The mandates of the plan aimed at improving arrangement of production system so as to reduce price risk, market uncertainty and to improve farmers’ technical knowledge and in turn to raise production efficiency. In addition to general extension services, the government reallocated 250 million Baht deposit in BAAC. The capital gain was used as interest compensation for the farmer participants in the program (3.5 % *p.a.*) . This incentive was used to encourage more farmer participants and to reduce production cost.

During 1987-1993,12 projects proposed by 20 private firms were approved. However up to 1993, two of them were not operated :

eucalyptus and integrated hog production. Three projects ceased after one year of operation. These were asparagus, ramie and bamboo for paper pulp, (OAE, 1993).

Seven projects had continued their operations. These included castor bean, Basmati rice, sunflower, wheat, barley, hybrid corn and sorghum, and cashew nut production.

The Office of Agricultural Economics (OAE) which was responsible for monitoring the plan, asserted that the results of the 4-sector plan were not satisfactory since some of these projects actually relied heavily on government support *e.g.* provision of free seed for sunflower growers. The unsuccess of the plan was caused by several factors. Firstly, it was the rigidity of term of contract which was purposively set forth for fairness to both the industrial firms and farmers. The firms lost flexibility in their management. Secondly, farmers participants felt they need time to adopt to new crops which usually accorded with new technology. When new crops did not provide desirable yield and return, farmers were discouraged and shifted back to their old crops. Thirdly, the extension service was also blamed for this failure, (MOAC, 1994) . The commodities required high inputs and exhibited high risk. The technological support and delivering system could not cover all the project areas. (These problems will be discussed further in the case of Chiang Mai experience)

After evaluation of the 4-sector plan, the Ministry of Agriculture and Agricultural Cooperatives (MOAC) proposed adjustment plan (on November 9, 1993). The committee was restructured to rectify the above problems. Two changes were recommended, 1) farmers could

obtain low-interest-rate loan instead of getting compensation for interest charge, 2) readjustment in term of contract made between firms and farmers to be more practical.

The Subcommittee for Improving Government-Private Sector Cooperation meeting (on May 23,1995) noted successful and unsuccessful projects of 4-sector plan and consequently concluded that : it was not necessary for every farmer to participate in contract farming, government agencies should not get involved directly in the contract between farmers and firms. Besides, business under contract should be expanded without perpetual support of the government. (NESDB, 1995) .

There should be an assurance that production, selling and purchasing of farm produce by the firms were conducted fairly. In addition, there should be risk guarantee for farmers, firms and financial institutions. The Subcommittee came up with several measures in response to the mentioned issues so as to modify cooperation between the governmental agencies and the firms. All measures centered around arrangement of coordination and risk sharing, such as, setting up “project fund” to provide compensation to production and marketing risk, or “group farming” or “cost sharing” among farmers and the firms. The last alternative was considered as a new and prospective measure, but it was not implemented.

Since 1995, the Subcommittee consented to support agro-industrial projects (under 4-sector plan) that met 3 conditions :-

- ability to reduce production risk,

- ability to reduce marketing risk, and
- ability to identify potential target areas and farmers.

The agro-industrial firms' proposals would be approved based on the highest benefit provided to farmer participants by the firms.

Finally, the Subcommittee also improved the 4-sector plan and indicated 2 target-commodity groups.

- Agricultural produce that has high export potentials *e.g.* high quality rice, fruit, flower, fresh water and coastal swamp fishes.
- Industrial crops *e.g.* vegetables, sunflower, maize and fast-growing trees.

Farmers participating in the approved project would be able to obtain low -interest-rate loan (5% *p.a.*). Eight projects covering the production area of 3.42 million rai, were approved which required credit approximately up to 4,984 million Baht, (MOAC, 1994). These projects involved trees for pulp, sunflower, maize, eucalyptus, teak and dairy production. The 4- sector plan is to continue into 1996-2000 (The 8th National Social-Economic Development Plan) (NESDB, 1995).

Contract farming in northern Thailand

Northern Thailand is known as having comparative advantage in vegetable production. Numbers of vegetable and fruit-processing firms had increased in the past decade (from 10 in 1984 to 100 in 1994). Among these, 36 firms located in Chaing Mai, 16 in Tak, 10 in Lampang and 9 in Lamphoon. Most of them were canneries. Numbers of potato chip and other potato product firms increased as the domestic

demand for snack, chips and french fry for fast food restaurants increased rapidly. The existing frozen firms were also expanding their business.

The northern region had rather long experienced in contract farming beginning with tobacco industry. The system worked successfully due to its market certainty since tobacco processing is the state enterprise. In 1973, a modern-formal contract on vegetables was introduced. The foreign joint-venture (Thai-Israel) which was a huge vertically integrated corporation (The Eisenberg Group of Companies) running from farm production to processing and exporting. The Thai Farming was in charge of raw material supply in the stream line. The company cultivated tomato, bean, onion *etc.* from its own plantation as well as purchased produce from contracted farms.

The Thai Farming Company was responsible for the supervision of crop production starting from land preparation right through to harvesting and to dispense various inputs and farm equipment. The company also sought for low interest rate loan (12 % *p.a.*) for the farmers. The company investment on supervision was enormous (construction of sub-office and hiring field supervisors).

During the early 70s the practice of growing crops for food processors was unknown to the northern farmers. Written contract was also unknown. Farmers were to deal with the company directly without middlemen involved (Laramee, 1975). To the farmers, the educational level had some bearing on their ability to understand the import technology. Besides, they were lack of understanding of the commitment to deliver their produce to the firm ; they sold their crops

to local middlemen who offered higher prices in order to meet their need for cash.

The failure of the Eisenberg Group was due to multidimensional factors. It was said that the Group was lacking in depth feasibility study to provide adequate understanding of social-economic background of the local farmers and economic environment.

Recent development of contract farming in Chiang Mai

There were a few recent studies on different aspects of contract farming in Chiang Mai and the North including The Northern Region Planning Office (1989) , Sukasem (1992), Gedgaew (1993), Ornberg (1995), Wiboonpongse and Sriboonchitta (1995), Sriboonchitta *et al.* (1996) and Rawangsap (1997). The micro level evidences in this section based heavily on the last 3 studies and specific details drawn from Sriboonchitta *et al.* (1996)

The common rice based cropping system in the irrigated lowland of the Chiang Mai Province (Figure 1) constituted two crops per year. Potato, tomato, vegetables, soybean, garlic, onion and second rice were usually the second crops after rice and sometimes followed by third crop of rice on short season vegetables. In the rainfed and non irrigated areas, potato, maize, upland rice are commonly grown in the rainy season. The survey was carried out in 1995 to study contract farming of 239 farmers who produced Japanese cucumber (20), hybrid maize seed (61) tomato (55) potato (52) and vegetable soybean (51). Except Japanese cucumber and hybrid maize seed, others were grown in the irrigated lowland.

Organization and arrangement of contract

Tomato and potato were produced to serve both contract and open markets, but hybrid maize seed, Japanese cucumber and vegetable soybean had only the contract market channel. Organization and arrangement of contracts differed among crops. It varied from verbal agreement to formal written contract, and from contract marketing to complete contract farming. The nature of contract would be expected to affect the whole system performance.

Tomato

Organization of contract of tomato was found to have 3 different systems in Chiang Mai (Figure 2). The open market system which local merchants made direct agreement to buy (or merely buy) the produce and sell to processing plants and fresh market in Bangkok and other consumers markets according to market force. This system was found in Hod, a southern district of Chiang Mai which was the main production area (88% of planted area of the province). The second system was written contract between firms and brokers or middle men. The brokers then made informal (oral) agreement with farmers. These brokers received seed on credit from the firms and then advanced seeds to farmers. This system was found in Chomthong District, south of Chiang Mai City. There was no price guarantee. The price received by farmers was prevailing market price. Both processing firms and brokers realized the high price in early of the season, the firms did not plan to purchase and to compete with open markets. Farmers were allowed to sell their produce which accounted for about 20 % of the crop production in the open market at favorable price. During the

peak season when market price declined to the firms acceptable level, and fruit quality (maturity) reached the processing requirement , brokers gathered the produce and sold to processing firms. Each brokers received certain quota (amount of seeds) he decided for himself based on his ability to fulfill. (Ornberg, 1995). The payment of seed was the only obligation to both brokers and farmers. This system served only 6% of tomato production area in Chiang Mai.

The third system was found in San Sai, northeastern district of the province. The brokers (largely village headmen) made verbal contract with processing firms. Secondary contract was between brokers and farmers, also informally. Similar to the second system, the brokers received quota seed from the firms and then allocated to their farmer participants. Beside seed, brokers also provided fertilizer and chemical inputs to their members. Some of the farmers did not take inputs for credit as they felt they could obtain from local suppliers at cheaper prices. Beside, they preferred to be less dependent on the brokers. Once again, no minimum guarantee price was specified . The tomato farmers in this area were obliged to supply tomato as much as the seed they acquired. Selling produce to open market was considered dishonest. However, there was no commitment for the firms to buy all the production from farmers. This was witnessed by the fact that in 1992 , the large amount of tomato was left rotten by the road sides and in front of a factory when one of the machine was broken down and processing became slow . There was no compensation for farmers at all. Consequently, most farmers gave up tomato and shifted to potato

and other crops. Those who continued growing tomato felt that their soils were not suitable for other crops.

Potato

The marketing system of potato was somewhat complicated. There were 2 marketing systems (Figure 3), *i.e.* an open market and a contract system. However, the open marketing was not a free system. Among a few agricultural commodities in Thailand, potato supply for open market has been under government's control via controlling imported tuber seed. This measure was used to limit supply and to keep the price in fresh market stable. To obtain seed, farmers needed to be members of The Potato Growers' Cooperative. In practice, farmers needed to sign up as members of existing groups of all kinds of crops *e.g.* "Paddy Group" at the village level which organized and initiated by government officials.

The role of the Potato Growers' Cooperative was significant as it controlled supply of potato entering fresh market so as to keep the price high and stable. It had monopoly on import of seeds for fresh market potatoes and decided on the seed quota for individual members.

The government did not impose import seed restriction on the processing potato production since all production was absorbed by the processing firms. In 1992, Sukasem (1992) reported 2 types of contract were observed. The complete contract between farmers and processing firms was made verbally. The firms provided seed, fertilizer, chemical inputs on credit to farmers as well as close supervision on cultural

practice. The farmers were committed to sell all production ungraded to the firms at the price they agreed in advance.

The second type of contract was less complete. The processing firms made contract with farmers' group (not with individual farmers) under witness of the district agricultural extension officers. The officers were to act as coordinators and witnesses arranging meetings between companies and representatives from the farmers' groups, to supervise the formulation of contract and to ensure that both parties obey the contract. In 1995, there were together 8 groups of processing potato growers and 3 processing companies. These numbers increased by double when more groups were formed in the adjacent districts and new processors established in Chaing Mai and Lampoon provinces.

Some processing firms provided financial support for seminars and technical meetings for farmers. The seminars, meetings and an annual potato fair were organized by extension officers for the benefit of farmers.

The provincial government had favored and encouraged the contract farming. The office would grant permission to firms based on their business security status. Despite of having responsibility in extension, technical services of extension officers were found insufficient due to shortage of staff. However, their role as coordinator was pronounced. In San Sai District where potato extension was successful, the district officer was said to be highly active and supportive. The same officer was later assigned to promote potato production in an adjacent district. The success of contract due to local official support was confirmed by an other incidence of the contract

market of the off-season mango in the same district (Wiboonpongse *et al.*, 1995)

The price for processing potato was set in advance in each year and farmers would receive neither more nor less than that specified in the contract. Prices for different grades of potatoes were the same for all companies. Examples of guarantee prices were 5.50 Baht/kg in 1993-4 and 5.90 Baht/kg in 1994-95 for big and medium sizes together. Small potato could not be used by the firms and received only 1.70 Baht/kg. The farmers preferred to get a minimum guarantee price rather than a fixed guarantee price contract, since market prices for fresh potato were usually higher. Consequently, some farmers secretly sold part of their contract produce in the fresh market for the more favorable price (as occurred in 1994).

Vegetable soybean, Japanese cucumber and hybrid maize seed

As compare to tomato and potato, vegetable soybean, Japanese cucumber and hybrid maize seed had strict and complete arrangement of contract farming. The main reason was that these crops required precision-production-management.

Vegetable soybean :Vegetable soybean was produced and processed as frozen product for export to Japan. The Japanese cucumber was semi-processed into prickly cucumber and also for Japanese market. Quality of both products was to meet international standard beginning with high quality of raw material in terms of physical properties and chemical-safety. Therefore the processing firms

provided close supervision in the farm production, harvesting and post harvest handling.

The agro-industrial firms selected the varieties (vegetable soybean) which provided high quality and high yielding. Seed was imported from Taiwan. The largest frozen firm in Chiang Mai started in 1989. It was a joint venture and it was one of the project under the 4-sector plan promotion program. The company had seriously developed working relationship with farmers to assure supply of produce matching market demand while also conforming to the high quality standards. The company initially contracted 4,000-5,000 farmers in Chaing Mai Province and the number increased to 20,000 farmers in 8 provinces of northern Thailand (Bloomfield *et al.* 1996).

Based on the firm's quality strategy, each farmer was allocated only limited acreage for the contracted crop based on the farmer ability to maintain quality standards. For each contract, a farmer was usually limited to 1 rai of crop (1600 square meters). In some cases, as the farmer demonstrated the capability to maintain quality, he might receive a quota of 1.5-5 rai. Beside seed, the firm provided its farmers fertilizer, chemical input on credit as well as cash for hired labor for grading bean. The firm's direct link with the farmers were its 20 extension agents and 100 brokers. The extension agents who had university degrees in agriculture, were stationed in the villages. They trained farmers the cultural practices. They met together at the company in Chiang Mai to report progress and problems and to receive instructions for further activities.

The brokers, many of whom were village headmen acted as middlemen. They made direct-formal contract with the firm but informal contract with the farmers.

The brokers, obtained seeds, fertilizers and chemical from the company for distribution to the contract farmers. They collected the harvested crop from the farmers and delivered to the processing plant. The brokers worked on a commission basis, which based on quality of the produce delivered as well as the quantity. The brokers had to be knowledgeable and be able to diagnose field problems. We had witnessed the closed working relationship between the brokers and the farmers in vegetable soybean farming, and even when the control was informal, there was hardly incidence of conflict between the two parties.

The contracted farmers were required to follow fertilization program but they could decide on insecticide use on their own. The farmers were also required to sell all marketable produce (grades A and B) to the company at prices fixed at the beginning of each production year. The prices usually varied from year to year depending on the processed product market in Japan.

Hybrid Maize seed: Farmers in the upland area of Phrao District used to grow maize, cotton, peanut, baby corn and chili prior to adoption of contract farming. Most of the contract farmers were from the Land Settlement Cooperative of Phrao (LSCP). In 1995, two multinational firms shared contract production of maize seed in cooperation of the LSCP. The farmers did not make direct contract with the companies but through the LSCP (if they were member) or brokers

who were responsible for seed distribution for the companies. The direct link to the farmers was via technical supervision in the field. For seed production, following instruction of the firms was the must. Operations on land preparation, fertilization, and especially cross pollination management were scheduled precisely. To ensure purity of seed, extension or field staff of the firms worked closely with the farmers. The farmer was to cut down his whole crop if he did not hand-pollinate the crop timely. There was no compensation for this mistake.

Japanese cucumber : Japanese cucumber had small and specific market so that it could be regarded as the smallest business as compared to the other commodities discussed earlier. It was monopsony because there was only one company making contract with farmers. The nature of contract and supervision was similar to that of vegetable soybean.

Farmers' attitudes toward contract farming

Based on the case study in Chiang Mai, Sriboonchitta *et al.* (1996) had indicated that the farmers joined the contract farming for a number of reasons, namely : market certainty for their produce (52 % of respondents), price stability (46 %), and provision of input on credit (28 %). They joined the program after observing their neighbor gained higher income (35 %). Other reasons mentioned by the contract farmers were lack of alternatives, expectation of higher price *etc.*

Most of the contract farmers grew only 1 contract crop (78 % of the respondents). Those growing Japanese cucumber had 2-4 different contract crops but only a few maize seed farmers had a second contract.

This indicated that the ability of farmers to handle relatively advanced production management was limited.

Attitudes regarding complexity of contract crops

Several studies revealed that new crops and new management would restrain farmers to continue the contracts. Evidence from Chiang Mai showed that 35 % (of respondents) felt the new crops were more complicated but 43 % felt opposite and 22 % were indifferent. However, their attitudes were affected by their production background and experiences. For instance, the cucumber farmers who grew cabbage and soybean found Japanese cucumber more difficult to manage but not those who experienced with tobacco, pea, or vegetable soybean. The farmers in Chiang Mai who had experiences in vegetable and horticulture crops production were likely to find production of all the mentioned contract crops relatively easy. The average lengths of contract of these farmers were 5.3 and 4.3 years for the primary and secondary contract crops respectively. The main reason for keeping contracts was high return of the crops relative to their other alternatives (52 %). Surprisingly, some farmers (16 %) indicated they did not know other alternatives. The certainty of market outlet accounted only for 11%.

The contract firms usually put the limit on the amount of land for contract farming to enable farmers maintaining standard quality. The average sizes of the contracted crops per household were only about half of what the farmers desired (Table 2). But only 40 % of the farmers wanted to expand their production size of the major contract. (Note that some farmers had 2 or more contract crops).

Attitudes regarding price and services

In a complete contract farming arrangement, whereas a processing firms' product was to meet consumer preference, the firm needed to provide the key input *i.e.* seed of selected variety and material inputs. Fertilizer and other chemical inputs were strictly controlled for use with care to ensure effective result and controlled residuals (especially important for vegetables). All the inputs were provided on credit to farmers through cooperatives, groups or middlemen. On the average, 80 % of the respondents were happy with the advanced credit in kind (Table 3) because they did not need cash investment (the farmers felt that this was not their investment). This was also convenient for them (35 %). For maize seed, potato and tomato, the farmers felt that the price of inputs were reasonable, (Table 3).

Most of the farmers had no information about the price of seed (84 %) but knew about the prices of fertilizer and chemicals (68 %) since the latter were available in the open markets. The farmers indicated that they found input prices were higher than they could obtain from the market (31 %), inputs with poor quality (9 %) were observed mostly by maize seed farmers who obtained inputs from the LDCCP. Most (40 %) did not have any problem with advanced input services.

Regarding government services, the farmers indicated they had never received any service (46 %) but about the same proportion did receive production advice (43 %), input supply (7 %) and meeting with

farmers (3 %). On the average, 40 % of the respondents were satisfied with the officials' services.

The farmers also identified the types of information and knowledge that were most important to them. They were ranked as follows : appropriate application of fertilizer and chemicals (38 %) new crops with available market (20 %), method of increasing productivity (17 %), appropriate production method (12 %) and others (13 %).

Farmer satisfaction with contract farming.

One would expect that most farmers were not satisfied with the price agreement. This was also true in our case study (*i.e.* 60 % of the respondents). High proportion occurred to cucumber, potato and vegetable soybean (75 % to 67 %). Less proportions were found in the case of maize seed (47.5 %) and tomato (49 %).

Price discount was usually expected when some part of the delivered produce was rejected. This did not normally happen except for tomato and potato. For tomato, the situation had changed since 1993/94. The resolution to improve terms of contract led to more certainty on price. Therefore, 62 % of tomato farmers reported they received the price agreed in advance, 14 % received less and the same percentage of farmers obtained more than the guaranteed price. For potato, only 2 % farmers reported they received discounted price. All other crops, the farmers received the agreed prices.

Except for cucumber farmers, those who grew other contract crops had varying numbers of choices with whom they would contract.

Only two choices for maize seed and vegetable soybean but more were available for tomato and potato. However, only 25 % of the farmers reported they changed (at least once) to other contracted firm, (Table 4).

Chances of changing contracted firms were influenced by a number of factors. The main factors included degree of competition among industrial firms (monopoly in case of cucumber, high competition in potato) and formality of the contract *versus* personal relationship between farmers and middlemen. In the case of maize seed, competition between two seed companies had dominant influence on benefit offered to farmers. However, the local manager of one company said that his company did not want to attract existing grower members of the other. For tomato and potato on the degree of competition, the personal relationship of middlemen (usually lived in the village and some were headmen or growers) had more impact to individual farmers (tomato) and the groups (potato).

In spite of being satisfied with the firms, the farmers showed their desires for services from the firms. The most important was to raise the contract price closer to the prevailing marketing level (55%). Among others were to reduce input price (20 %) especially in the case of vegetable soybean, (Table 5).

Performances of the Contract Farming

Theoretically, contract farming is to provide several advantages for growers and agro-industrial firms. To farmers, they have an assured market, stable income, access to the firms' services, ease of credit

access and technical know-how. To the agro-industrial firms, they have assured supply of good quality raw material at less fixed investment and low cost. Specific outcomes of the contract farming on these aspects are discussed as follows :

Farmers' income and risk

In the Chiang Mai case study, 50 % of the farmers earned off-farm income prior and after joining contract farming. The contract had neither affected their off-farm activities nor income from contract farming. However, after the contract, 74 % of all respondents enjoyed higher household income. Only 5% reported their household income had reduced. Despite of earning higher income after contract, some farmers (26 %) could incur loss due to production risk (all crops) and market risk (tomato). Most of these farmers (65 %) had only 1 loss. The major problems were crop damage due to flood and diseases. (Sriboonchitta *et al.*, 1996).

Unfortunately more specific comparison was limited to only 2 crops which had parallel markets *i.e.* potato and tomato. Tables 6 and 7 show series of net return and variation per rai of the crops under contract and non contract conditions. On the average, the non-contract production of both crops provided slightly higher income (2.5-10 %) but income instability of producing for open market of potato averaged 185 % over that of contract. The variation of income earned from open market had reflected price risk and production risk for both crops since the prices were determined by varying demand and supply in the market. However, the contract tomato farmers had higher income variation than their counterparts due to the informality of contract

agreement and uncommitted responsibility of the processing firm as mentioned earlier. As for potato price was more under supply control, even though it varied. On the other hand, the income variation of the contract came mainly from yield risk since prices were guaranteed and made known to the farmers in advance. Whilst, there could not be any difference in production management of contract and non contract crops, the difference in income variations was highly affected by market risk.

Efficiency

Efficiency here refers to the combined effects of production and allocative efficiencies in order to minimize a unit cost and response to the short-run market situation.

Comparison of the production costs between contract and non contract was not available in other studies. Therefore the conclusion here should not be over generalized. The unit costs of potato and tomato of the contract farms were lower than that of the non contract farms. For vegetable soybean, it was compared with the grain soybean in terms of cost-price ratio. Again, the contract farmers outperformed the non contract farmers.

The farmers of both types proved to be profit maximizers under their different production conditions.

Under low output price condition, the input utilization appeared to be relatively low. This was evident as in the case of contract potato of which price was relatively lower than fresh market price. It was the effect of price level that determined input utilization. Sukasem (1992)

reported that contract vegetable soybean, non-contract soybean, both types of tomato and potato farmers were all economic rationale. They used various production inputs at optimal levels (*i.e.* value of marginal product approximately the same as the price of input). This proved that the farmers were highly responsive to price (Wiboonpongse and Sriboonchitta, 1995).

Evidently, the contribution of agro-processing firms in this respect was pronounced. The frozen firm's new variety of vegetable soybean raised yield from 800 kg/rai (in 1991/92) to 1,300-1,700 kg/rai (in 1993). On the other hand for the loose contract like tomato, the varieties used by farmers in the open market were those once introduced by contract firms. Therefore fresh tomatoes available in the market were processing type and consumers could hardly find table tomato.

Quality improvement and raw material supply assurance

The contract farming in Chiang Mai had presented an optimistic picture of assured raw material supply of desirable quality at low cost. In the past 25 years, when the word "quality" was foreign to the farmers, the contract farmers did not realize the importance of specific variety of seed, punctual harvesting and precision of cultivation practices. Lack of understanding led to improper care of crop and poor quality of produce, and thus it caused conflicts between the farmers and the processing firms on over ripen tomato and other vegetables when raw materials of poor quality being rejected. Both farmers and processing firms had long process of learning and adjusting to install the raw material quality requirement. Presently, the contract farmers

had gradually learned to accept concept of "quality" while farmers in general who sold their ungraded produce in the open market were less familiar to it. In the strict contracts such as vegetable soybean and Japanese cucumber, the contract farmers realized that the prices relied heavily on grades and their income depended on quantity of good grades they produced.

The agro-processing firms, for their own purposes, selected proper varieties and designed appropriate cultural practices and inputs in order to obtain high quality raw material. Evidently, the farmers (in our case study) were ready to follow the production instruction which coincided with the farmers' profit goals. Meanwhile, the firms were particularly careful in screening farmers they contracted. Diligent and honest farmers received first priority. This was true in the Chiang Mai case and in the Manarangsarn and Suwanjindar (1992) studies. As mentioned, the farmer production of contract crops was limited to ensure quality. The field supervision partly helped monitor production for quality produce as well as provide regular check of predicted total production. However, the latter practice did not ensure supply of raw material. The firms, through middlemen, terminated the contract when a farmer was found secretly sell his/her produce to open market or other firms. This measure proved to be effective for vegetable soybean. As the consequence, this firm could expand its production over twice within 5 years.

Opportunities for farmers to gain new knowledge.

On the technical know-how, the contract vegetable soybean, cucumber and maize seed farmers had learned new knowledge directly

from the firms' extension staff. For potato and tomato farmers, they had experiences and knowledge prior to contract. However, potato farmers did receive knowledge from universities under firms' support. The knowledge of fertilizer and chemical applications as well as intensive and scheduling production could be transferred to other crops. The potato farmers mentioned that they applied the same production techniques to potato produced for fresh market. Manarangsana and Suwanjindar (1992) reported differently that the farmers participating in contract farming projects of oil palm, pineapple and asparagus gained new technical knowledge from input suppliers who launched sale promotion (*e.g.* demonstration plot). The pineapple canneries were found to be most active among the others in disseminating knowledge to the farmers. The oil palm farmers were able to adapt the knowledge to rubber production. However, Manarangsana and Suwanjindar (1992) noted that the knowledge learned from broiler production was difficult to apply to other type of agricultural production. As the farmers were closely supervised and instructed, they hardly exercised their decision in crop management, input purchasing, and marketing their output. The contract farming could lessen farmers' entrepreneurial ability, but increase precise managerial skill. The farmers in contract prawn production in southern region (OAE, 1989) and duck contract (OAE, 1991) in eastern region expressed that they lost their freedom in farm management. This drew back their knowledge development and decision ability. Besides, they lost freedom to acquire inputs. The advantages and disadvantages were indicated in several contract farming studies (Table 8).

Credit

Farmers in general could obtain loan from the BAAC and cooperatives they belonged. Under contract system, some private companies were part of the 4-sector plan and thus credit was available to farmers at lower cost. Besides, credit in kind of input accounted for considerable amount. For instance vegetable production which was capital and labor intensive, the non-imputed expense accounted for 44 % (Japanese cucumber) to 76 % (potato). There were expenses on seed, fertilizer, chemicals and (small amount) on hired labor. Seed was usually the most expensive item for potato.

Manarungsan and Suwanjindar (1992) concerted that the BAAC failed to meet the credit targeted to asparagus and oil palm growers due to inadequate cooperation among the four parties concerned. The reason for failure was that the number of oil palm growers participating in the project was too small. As for asparagus, the amount of loan given to each borrower (2,000-3,000 baht/rai) was about the same amount the farmers actually obtained from the joint liability group scheme under BAAC. Thus there was no incentive for farmers to join the BAAC credit program under the 4-sector plan. This credit program was recently modified as discussed in the earlier section.

The fact presented here partly explains the role of credit in promoting contract farming. While credit is so important in financing production, it cannot stand alone without proper management of contract in other aspects.

Conclusion

When the Thai agriculture has gradually changed from export of raw materials to export of more value added goods through the development of agro-industries since the Sixth National Economic and Social Development Plan, contract farming is seen as a promising means of achieving fair benefit for both farmer producers and industrial firms. However, as the case study of contract farming development in Chiang Mai has revealed, both farmers and industrial firms have to change the perception and readjust according to the social-economic setting but keep the production competitive in the international market.

The successful cases have indicated that beside the specificity of the agricultural product, the firms are able to secure the export markets, to negotiate the acceptable price, and are able to identify potential production areas, to organize target farmers, and to disseminate information and technology to the farmers. As far as the farmers are concerned, they have to change from productivity oriented to a more quality oriented production strategy. The change requires a concerted effort by both governmental extension agents and the firms' field supervisors. Farmers' goals, technical as well as social economic background should be considered, and the production plan, target and anticipated benefits and risks should be spelled out so that both farmers and firms have mutually understanding of the proposed enterprise. The present practice of contract farming has seen the active role of the provincial agricultural officers as the coordinator and witness of the joint venture.

The early development of contract farming in Chiang Mai, as exemplified by the Thai Farming Company, has witnessed the collapse of enterprise, even the infrastructure of the company was well equipped and with good support of professional staff, but the working relationship between the company and the farmers was not on equal and dignified terms, and this missing link between the firm and the farmers has abused the concept of contract farming.

The five commodities as studied in the Chiang Mai case show varieties of farmer production strategies and the contract arrangements between the firms and the farmers thus enabling the enterprises to be “successful”.

Tomato and potato, both are non-indigenous but introduced crops for over twenty years, have adapted well under farmers’ current management practices. Therefore the contribution of the firms in terms of technological innovation is not significant, and farmers have more options, either to engage in open market or contract market with the firms.

The other three crops such as vegetable soybean, Japanese cucumber and hybrid maize seed production represent new crops to the farmers. Vegetable soybean where pod size and pod appearance are important characteristics, requires intensive fertilizer management and pest control measures. The crop is processed as frozen product and the market is so specialized that made the open market not profitable. However, farmers could sell the rejected materials on the open market.

Japanese cucumber which is not familiar to the local consumption has specific Japanese market and made the open market not feasible. The contract production of hybrid maize seed also falls into the same category where the product is designed by the individual firms. All three crops are initiated by the firms and the cultivation of these crops are just recent. Farmers have to adjust (and sometimes modify) the new technology package and only the contract farming can make the whole enterprise successful. Therefore new working philosophy between the farmers and the firms has to be established.

Farmers in the Chiang Mai valley who are traditionally practicing diversified and intensive rice based farming systems, can incorporate contract farming to stabilize and increase their farm incomes. When the farmers have acquired better production and management skills, they can work on contract crop and at the same time invest their capital and inputs on other commodities to generate higher farm income, as seen by the case of farmers who are contracted to produce Japanese cucumber.

The case of tomato and potato indicates that when farmers have gained production skill, they can operate the crops either in terms of open market or contract market, to minimize marketing and price risks.

The Thai agricultural policy emphasizes the promotion of exporting high value added, high quality products. The implementation requires high capital investment and technical skills, contract farming is seen as a promising approach to achieve the goal, with given conditions as discussed.

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Table 1 Proportion of farmers making one or more contracts

Contract crop	Japanese	Hybrid	Tomato	Potato	Vegetabl	Total
	cucumber	maize seed			e soybean	
Total no.of respondents	20	61	55	52	51	239
1 crops	22.7	91.8	75.6	84.2	57.9	78.2
2 crops	40.9	8.2	27.4	14.0	29.8	17.6
3 crops	18.2	-	-	1.8	12.3	2.5
4 crops	18.2	-	-	-	-	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 2 Desired planted area for expanded contract.

Contract crop	Japanese	Hybrid	Tomato	potato	Vegetable	total
	cucumber	maize seed			soybean	
Total no. of respondents	20	61	55	52	51	239
	(rai per household)					
Total area desired	2.6	12.5	5.2	4.9	5.7	6.2
Total area cultivated	1.6	5.6	3.1	3.3	4.2	4.0
To be expanded	1.0	6.9	2.1	1.6	1.5	2.2
No. of farmers desire for expansion	10	32	15	11	26	94

Table 3 Percentage of farmers satisfied with advanced credit in kind and reasons

	Japanese cucumber	Maize seed	Tomato	Potato	Vegetable soybean	Total
Total observation	20	61	55	52	51	239
No. of satisfied respon.	17	50	43	45	38	193
Reasons	Percentage of satisfied respondents					
1. Not own investment	94	80	44	58	66	65
2. Convenience	29	24	37	29	61	36
3. Reasonable price		8	5	18	-	7
4. Compensation in case of loss		2			3	1

Table 4 Changing the contracted firms

Contract crop	Cucumber	Maize seed	Tomato	Potato	Vegetable soybean	Total
Total no.of respondents	20	61	55	52	51	239
	(Percentage)					
Never change	100	46	95	75	80	75
At least once	0	54	5	25	20	25
	(times)					
Average no. of changes	0	1	1.4	2	1	1.24

Table 5 Contract Farmers ' demand for support from the contract company

Contract crop	(percentage)					
	Japanese cucumber	Maize seed	Tomato	Potato	Vegetable soybean	Total
No. of respondents	20	61	55	52	51	239
1. Increase of product prices (to close to market price)	60	43	53	60	67	55
2. Decreases of input prices	45	3	4	4	65	20
3. Frequent visit and advises	5	-	7	2	6	4
4. Reducing discount	-	31	-	-	23	13
5. Providing high yielding seed	-	30	-	-	-	8
6. Cooperating with farmers in selling	-	7	-	-	-	2
7. Collecting produce punctually	-	7	-	4	-	3
8. Subsidizing for crop failure	-	7	-	-	-	2
9. Guarantee fixed price	-	-	4	-	-	1
10. Others	25	5	5	6	3.92	7

Table 6 Net return per rai from 1984/85 to 1990/91

Crop	(Baht/rai)							
	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	Average
Contract Potato	-	-	-	7,790	5,357	7,268	13,862	8,469
Noncontract Potato	3,931	5,346	1,620	15,288	12,847	-	14,395	8,676
Contract tomato	3,435	960	6,874	4,424	8,623	2,910	5,686	4,658
Noncontract tomato	6,120	4,279	4,536	4,381	3,710	6,095	6,706	5,118

Source : Gedgaew (1993)

Table 7 Variation of net return to farmer

Crop	(Baht/rai)			
	Average	Variance	SD	CV
Contract Potato	8,469	13,791,878	3,717.7	0.438
Noncontract Potato	8,676	29,866,013	5,464.9	0.818
Contract tomato	4,658	6,700,042	2,588.4	0.556
Noncontract tomato	5,118	1,341,426	1,158.2	0.226

Source : Adapted from Gedgaew (1993)

Table 8 Advantages and disadvantages of contract farming (CF).

Advantages/Disadvantages	Case of CF
<u>Advantages</u>	
1. Stable income	Baby corn ¹ , pineapple ² , vegetable seed ³
2. Higher income than non CF	Baby corn
3. Market certainty	Baby corn, pineapple, vegetable seed
4. Delivery service for inputs	Baby corn, pineapple, vegetable seed
5. Ease of obtaining input	Baby corn, pineapple, prawn
6. Loan made available though financial institutions	Baby corn, pineapple, vegetable seed
7. Learning new technology	Baby corn, pineapple, vegetable seed
8. Infrastructure : road and ditch	prawn
9. Information, news and networking	prawn
10. Quality development	vegetable soybean, maize seed
<u>Disadvantages</u>	
1. Lack of freedom on farm management and decision	prawn, duck ⁴
2. No freedom far buying input	prawn, duck
3. No bargaining power, low price	prawn, vegetable seed, asparagus ⁵
4. Slow or delay transportation from farm damaged the produce	tomato

Source : Sriboonchitta et al. (1996)

Note : 1. OAE. (1993) 2. OAE. (1986)
 3. OAE. (1990) 4. OAE. (1991a)
 5. OAE. (1991b)

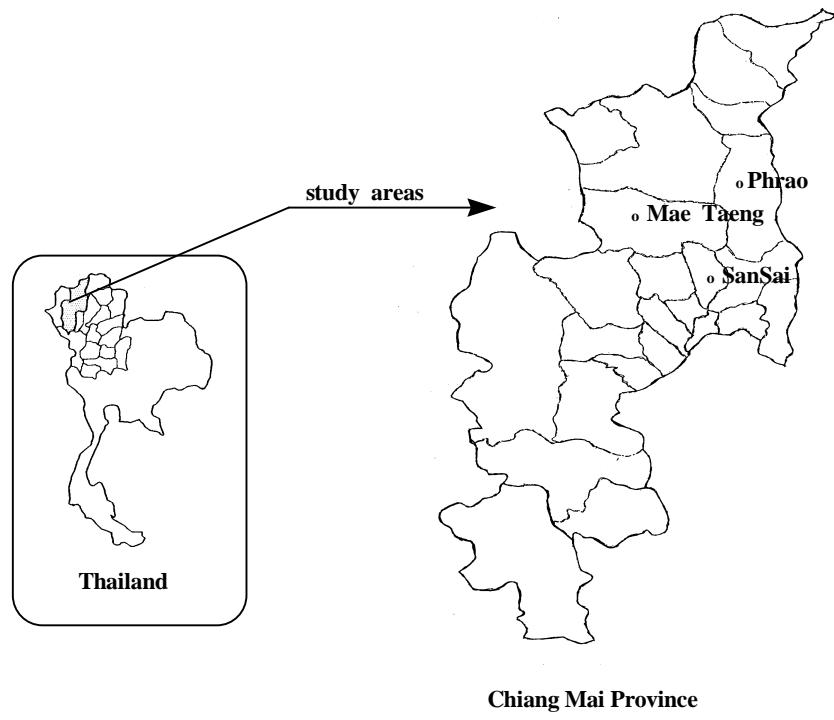


Figure 1 Map of Thailand and Chiang Mai Province

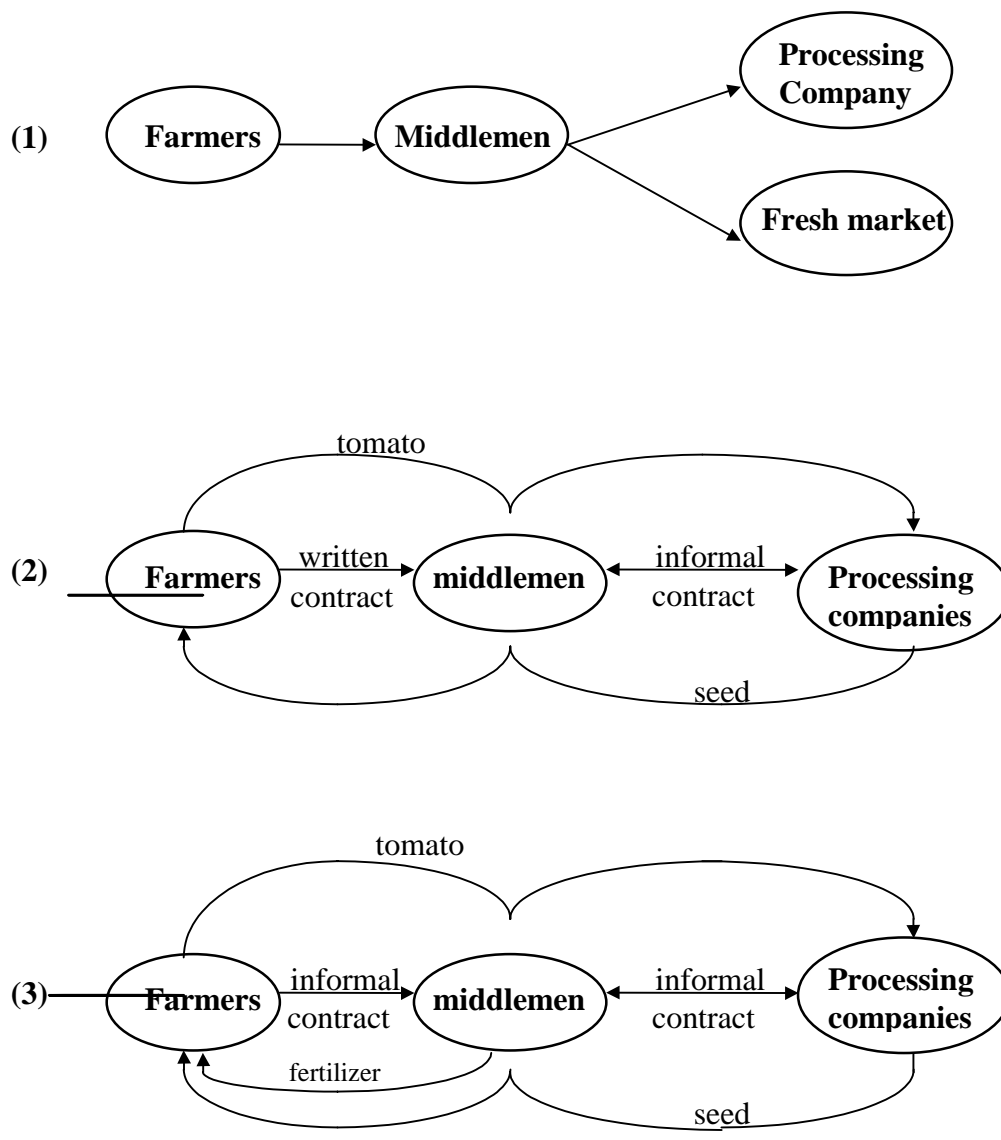


Figure 2 Three different marketing systems of tomato

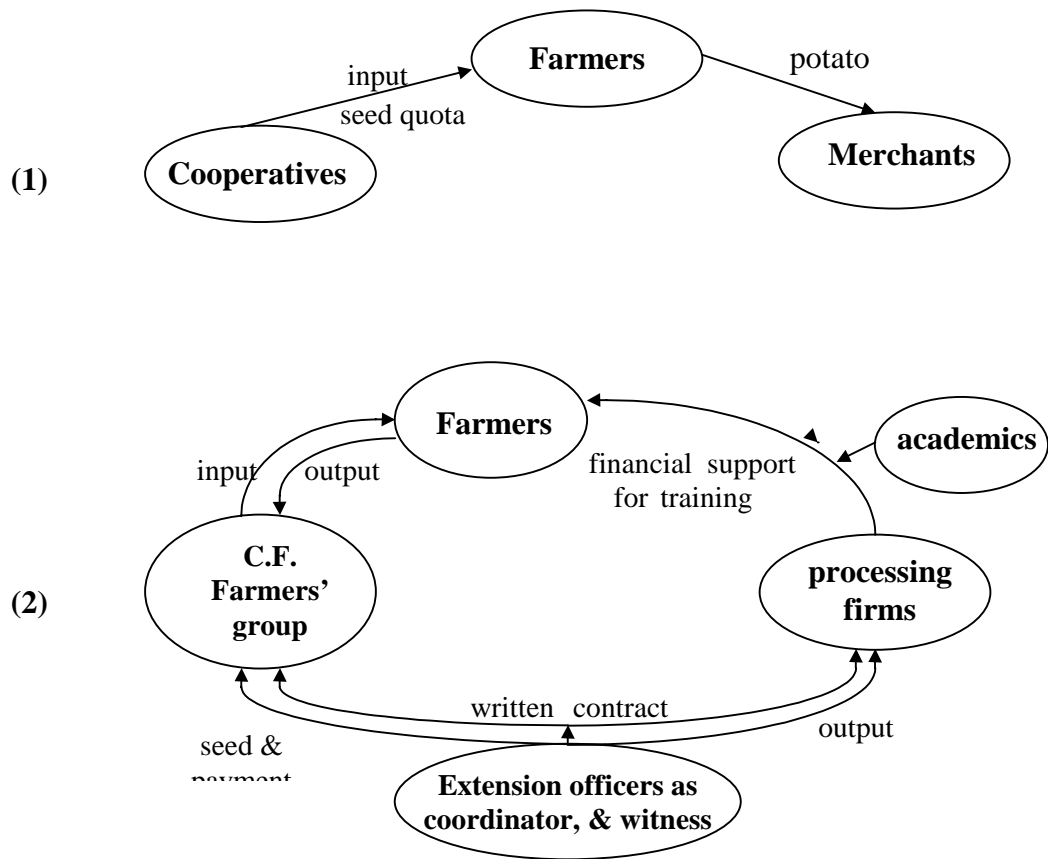


Figure 3 Two different marketing systems of potato.

