

## 7. Proposal of Candidate Project-Clusters

### 7.1 Candidate Project-Cluster 1: Development of Coffee in Sekong Province

Almost all the coffee that is produced in southern Laos is purchased by Japanese companies. Japanese companies want more coffee, and local Laotian processing companies strengthen the processing capacity. However, the appetite for coffee is not being satisfied, because Laos is not currently able to respond to the demand.

Currently, Dakchung district in Sekong province is beginning to attract attention as a new coffee production site. Dakchung district comprises between 15,000 and 20,000 ha of land that is appropriate for coffee cultivation that has not been developed for coffee production owing to relatively inaccessible traffic access. However, the improvement of trunk road has recently commenced, and traffic accessibility will ultimately improve.

Considering the above-mentioned situation, the JICA survey team proposed the “Project-Cluster for Development of Coffee in Sekong Province.” The cluster comprises the following: (1) ODA Project: Project for Strengthening Coffee Cultivation and Supporting Post-Harvest Processing in Sekong Province, (2) Private Project 1: Coffee Processing by Local Processing Companies, (3) Private Project 2: Purchase of Laos Coffee by Japanese Companies, (4) Public Project 1: Removal of Unexploded Ordnance by Laotian Government, and (5) Public Project 2: Development of Rural Infrastructure by Laotian government.

This cluster is intended to produce enough coffee harvested in Sekong province to meet Japanese companies’ demand for coffee and export the coffee to Japan. The ultimate goal of the cluster is to contribute to the development of the coffee industry in southern Laos, to improve farmers’ living standard, and to create a stable supply of coffee to Japan.

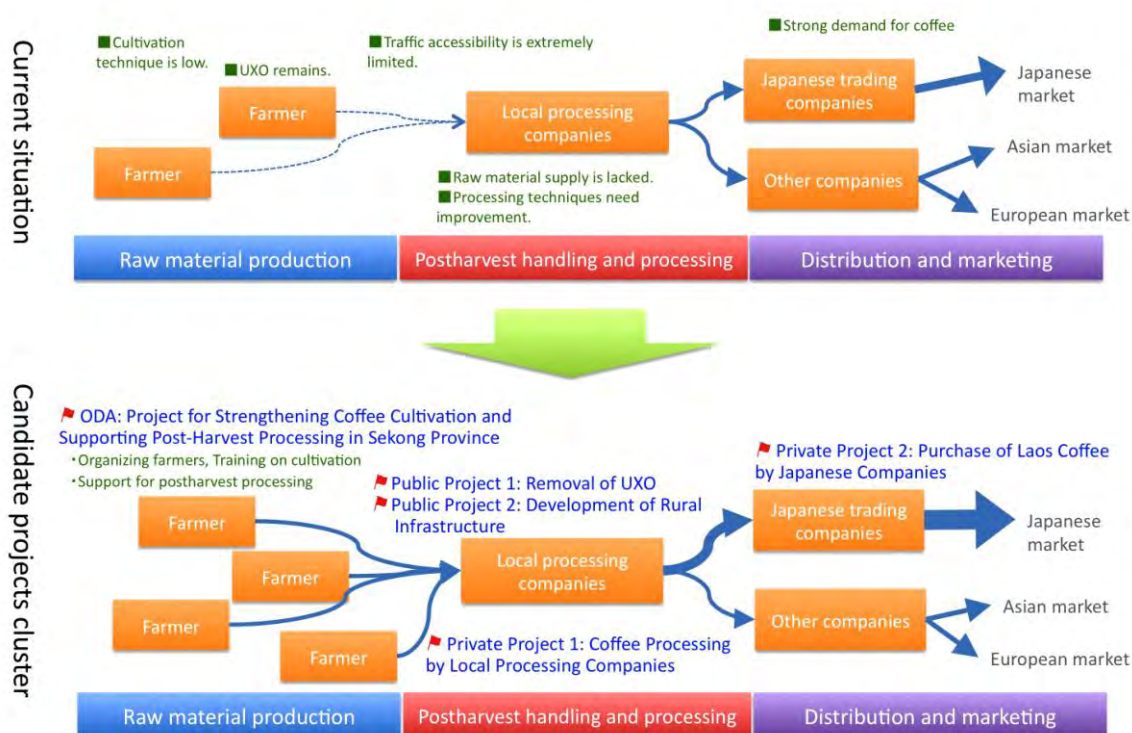


Figure 7-1 Overview of Candidate Project-Cluster 1: Development of Coffee in Sekong Province

### 7.1.1 Background

#### A. Booming Coffee Market

The global coffee market is booming. World consumption increased by 30% in the last 10 years, and currently the price of coffee is the highest in over 10 years. This is because consumption, especially of emerging countries, is growing. Bolstered by the growing demand, as a result of improving income in the emerging market place, the coffee market will continue to grow.

The coffee industry in Laos is booming as well. The southern area of Laos, in particular Bolaven Plateau, with its appropriate coffee-growing climate and altitude, is able to maintain coffee farms of 25,000 ha. Farmers are engaged in coffee cultivation, and the processing companies are making an effort to strengthen coffee processing capacity and improve its processing technology. Singapore, Thai, and Vietnamese companies have launched projects to southern Laos.

#### B. Domination of Laotian Arabica Coffee by Japanese Companies

Japanese companies have a prominent presence among foreign companies purchasing Laos coffee. The truth is that almost all Arabica coffee produced in Laos is purchased by Japanese companies. A Japanese trading company is the largest customer of the biggest processing companies in Laos, and another Japanese trading company actively purchases precious coffee. It is not an exaggeration that Japanese companies, or the Japanese market, encapsulate the coffee industry of Laos.

#### C. Local Processing Companies Strengthen Processing Capabilities

In order to respond to demand by the Japanese companies for coffee, local processing companies are strengthening their processing capacity and improving their respective processing technologies. The biggest processing company in Laos now has enough capacity to double its current production amount.

#### D. Increase of Raw Materials Production Is Needed.

Raw material production (coffee cultivation) has not responded to the strong demand from Japanese companies and the increased processing capabilities. Consequently, processing companies are not able to use half of their capacity. The shortage in raw material production is a bottleneck for Japanese companies to purchase more Laotian coffee.

#### E. Dakchung District in Sekong Province as a New Production Site Attracting Attention

Dakchung district in Sekong province is now beginning to attract attention as a new coffee production site. Dakchung district has between 15,000 and 20,000 ha of land appropriate for coffee cultivation that has not been developed for coffee production owing to difficult traffic access. Improvement of the trunk road, however, has recently begun, and traffic accessibility is planned to markedly improve in the near future. Responding to this situation, the local Laotian government plans to eagerly promote coffee cultivation, and private companies have started developing coffee plantations as well.

Dakchung district has been isolated and is one of the poorest districts in the country. Farmers in the district have low farming skills. Additionally, since the Ho Chi Minh Trail ran through the district, there are still a large amount of unexploded ordnances (UXO). These challenges should be addressed in order for the district to grow into a major coffee production site.

Considering A. to E., the JICA survey team proposed the project-cluster, “Development of Coffee in Sekong Province”, in order to develop Dakchung district into a major coffee production site.

## 7.1.2 Plan of Candidate Project-Cluster

### A. Mission

The mission of the Sekong province Coffee Development Project Cluster is to grow Dakchung district in Sekong province into a major coffee production area and to strengthen the existing value-chain that Laos coffee has been brought to the Japanese market by Japanese companies. Further goals include realizing an increase in the purchase of coffee by Japanese companies, stabilizing the supply of coffee to the Japanese market, reducing poverty in Dakchung district, and developing the coffee industry in southern Laos. The numerical target is to achieve 3,000 ha of coffee cultivation areas and 4,500 tons of coffee green bean production by the year 2020.

### B. Target Area

Dakchung district in Sekong province



### C. Outline

The cluster consists of the following projects:

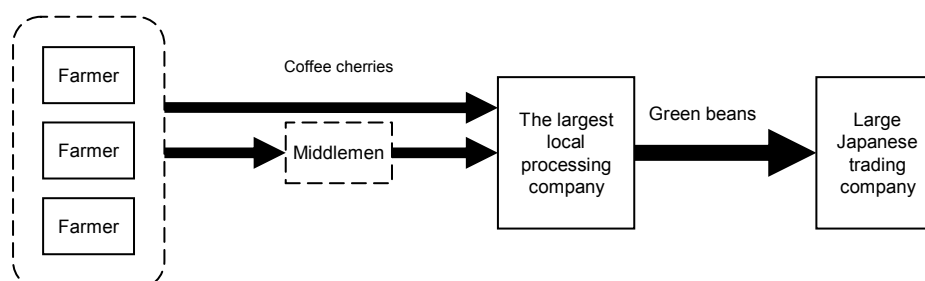
- ODA Project: Project for Strengthening Coffee Cultivation and Supporting Post-Harvest Processing in Sekong Province
- Private Project 1: Coffee Processing by Local Processing Companies
- Private Project 2: Purchase of Laos Coffee by Japanese Companies
- Public Project 1: Removal of Unexploded Ordnance by Laotian Government
- Public Project 2: Development of Rural Infrastructure by Laotian government

The cluster is divided into first and second phases. The first phase focuses not on quality but on quantity. It prioritizes the increase of the quantity of coffee production. The second phase pursues both quality and quantity. Specifically, in the second phase, high-valued coffee, such as specialty coffee and organic coffee, will be produced, and post-harvest processing will be conducted by some farmers.

The following describes the two phases in detail.

### The First Phase

#### Situation pursued by the first phase



Farmers in Dakchung district cultivate Arabica coffee with the ODA project's support of cultivation techniques and subsidies for seedlings.<sup>103</sup> Although the cultivation areas are limited to areas where UXO are removed, or where farming has been performed for a long time, cultivation areas are to be expanded by Public Project 1 removing UXO and Public Project 2 developing the rural infrastructure, such as rural roads and water facilities.

As mentioned above, the first phase is focused on increasing the amount of coffee production and enabling farmers to obtain basic and proper cultivation techniques for providing stable yield and preventing disease. The first phase does not target improved techniques for high value-added processes, such as special cultivation recommended by companies pursuing outstanding quality. There are two reasons why the first phase targets only quantity. The first reason is that companies purchasing coffee cherries from farmers do not require high-quality cherries but larger amounts of cherries. According to companies, coffee green beans, which are the final processed products, owe their quality to not cultivation but to post-harvest processing. Unless a coffee cherry is cultivated and harvested under seriously poor conditions, the cherry can be processed into an acceptable quality green bean. The second reason is that the technique for high value-added processes is too difficult for farmers in Dakchung district to practice, because the farmers have little experience in producing coffee.

Coffee cherries of the district are purchased and processed into green beans by processing companies, which is appropriate under the purview of Private Project 1. Dao Heuang Group Ltd is the processing company that will purchase and process the cherries in the first phase for the following reasons: (1) the company maintains a much larger available processing capacity than others—it is currently in need of more coffee cherries; (2) the requirement of the company on coffee cherries is not demanding, and (3) the company is the biggest supplier to a Japanese trading company, which is the largest customer of Dao Heuang Group), that purchases a sizable amount of Laotian coffee. There is no doubt that Dao Heuang Group will purchase cherries from Dakchung district and sell green coffee beans to the Japanese trading company.

The structure of the collection of the coffee cherries from Dakchung district to Dao Heuang Group is expected to be relatively simple. The company offers the same purchasing price of coffee cherries to any person and/or organization that supply the cherries to the company. It does not distinguish

<sup>103</sup> Catimor is recommended for cultivation, because it is easy to grow and currently accepted by Japanese companies. Dakchung District has the appropriate climate and altitude for Catimor, and Catimor commands a higher price than Robusta. However, other varieties than Catimor are recommended for the purpose of diversification and risk reduction.

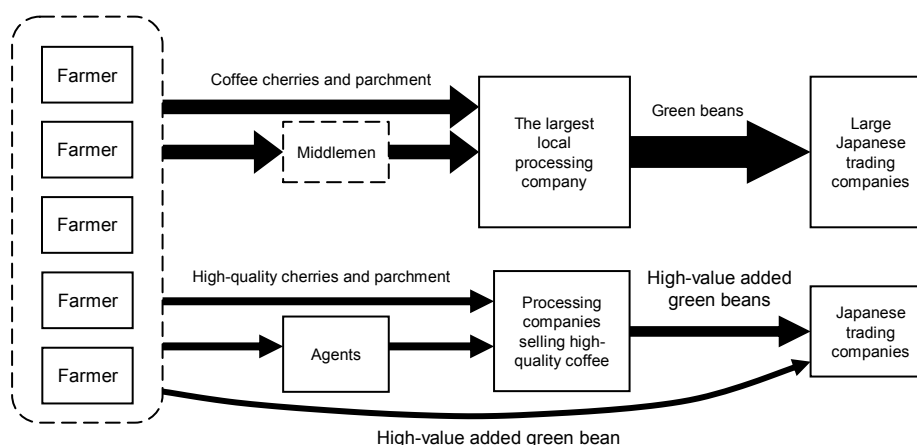
between individuals and organizations selling cherries, and does not assign its agents to the transactions. Therefore, anybody who has a means of transportation can start a business as a middleman, and eventually those people and organizations that most efficiently operate the business will continue the business. After the construction of Route 16 is complete, transportation costs will be tremendously reduced, and many people and organizations will be able to start an intermediary business. Farmers may not be confronted by a challenge regarding the collection structure.

Private Project 2 involves the purchase of coffee by Japanese companies. In the first phase, the Japanese company that purchases a large supply of Arabica coffee from Dao Heuang Group will receive coffee that is newly supplied from Dakchung district. At present, the Japanese company is the largest purchaser of coffee of Dao Heuang Group and needs more coffee from the company. Therefore, the newly produced coffee will certainly be distributed to the Japanese company.

The first phase targets expansion of the coffee production within two or three years; the second phase is to be launched subsequently. The launch of the second phase does not mean the end of the activities of the first phase. Presently, 15,000 to 20,000 ha of land appropriate for coffee cultivation has been found across Dakchung district. The district's land mass is so immense that the first-phase activities will not be fully completed; therefore, the activities of the first phase need to continue into the second phase. In short, the second phase comprises the activities of the first phase and activities added from the second phase, that is, the production of high value-added coffee and farmers' post-harvest processing.

## The Second Phase

### Situation pursued by the second phase



The second phase will realize farmers practicing post-harvest processing, supplying parchments, and establishing a value-added chain of high-quality coffee, whereas the series of the value chain established in the first phase proceeds.

Activities regarding the post-harvest processing are as follows.

Farmers gain adequate cultivation techniques and experience conducting the wet processing of the coffee beans. The ODA Project provides technical assistance and equipment subsidies, as required. Farmers sell parchments to Dao Heuang Group or other companies. The flow after parchments are purchased by companies is the same as the flow of cherries.

Parchments have three significant differences from cherries. The first difference is that the purchase price of parchments by local processing companies varies depending on the quality of the parchments. As for Dao Heuang Group's purchasing price, the price of cherries is the same, irrespective of cherries' quality; however, the price of parchments varies. This means that farmers benefit from good processing and stand to lose from bad processing. Farmers will be encouraged to improve processing quality, and eventually the quality will improve. The second difference is that parchments are preservable. When weather is bad and cherries cannot be shipped, farmers can wait until the weather changes by having cherries processed into parchments. When the price of cherries and parchments are low, farmers can wait until the prices rise, if farmers process cherries into parchments. The third difference is that parchments weigh 80% lesser than cherries. The processing of cherries into parchments enable farmers to reduce transportation costs.

Activities regarding the high-quality coffee production are as follows.

Farmers who gain adequate cultivation techniques and experience, engage in coffee farming that create high value. The ODA Project provides technical assistance. When applied techniques for cultivation are specified, involvement of companies dealing with high-quality coffee is necessary. This is because the definition of high-quality coffee (i.e., "quality standard") is specified separately by each company. For example, Sinouk Café specifies a standard having 17 conditions. It is the case that business terms, as well as a quality standard, are stipulated and that contract farming is applied. In short, it is a prerequisite that a close relationship with companies dealing with high-quality coffee is built.

In Private Project 1, harvested high-quality coffee cherries and post-harvest processed parchments are purchased by local processing companies dealing with high-quality coffee. Expected companies that purchase such high-quality cherries and parchments in the second phase are not Dao Heuang Group but medium- or small-scale processing companies, or farmers' groups. It may be a case that coffee farmers' groups in Dakchung district sell cherries and parchments directly to the Japanese companies.

As for the collection system of high-quality coffee from farmers to processing companies, agents assigned by processing companies will collect the cherries and parchments. They will check the quality of the cherries and parchments and examine coffee farms.

In Private Project 2, expected Japanese buyers are Japanese trading companies that purchase precious, or unique, coffee from all over the world. Such Japanese trading companies already purchase Laotian coffee.

#### D. Price Information

This portion of the report organizes information on expenses for, and revenue from, coffee farming.

The expense for the first cultivation year is 10 million Kip per hectare, according to estimation by the Southern Agriculture and Forestry Research and Extension Center (SAFREC). The expense from the second year is 6.7 million Kip per hectare and per year as follows:

- Fertilizer: One hectare of a coffee farm needs almost three tons of fertilizer; 25 kg of cow manure in a bag costs 10,000 Kip. Therefore, one hectare of coffee farming costs roughly 1.2 million Kip.
- Labor for weeding: One hectare requires 20 days of labor for weeding. Labor cost is 25,000 Kip per day. Therefore, weeding in 1 hectare costs 1 million Kip.
- Labor for harvest: Wage according to the amount of harvested cherries is 500 Kip per one kilogram of cherries. The amount of cherries from one hectare is nine tons. Therefore, the cost for harvest is approximately 4.5 million Kip.

The revenue in the first year is zero, because after the transplantation of seedlings, the plants can be

harvested only after 18 months. The revenue in the second year is approximately 31.5 million Kip, because the price of cherries per kilogram is 3500 Kip,<sup>104</sup> and 9 tons of cherries, on an average, are harvested from 1 hectare. Therefore, the revenue from the second year exceeds total expenses from the beginning to harvest: 16.7 million Kip.

## E. Pre-Condition for Japanese Company to Launch Projects

There is no precondition for Japanese company to increase the purchase of Laotian coffee, because Japanese companies already buy Laotian coffee and have a need for more coffee.

### 7.1.3 ODA Project: Project for Strengthening Coffee Cultivation and Supporting Post-Harvest Processing in Sekong Province

#### A. Scheme

Technical Assistance Project

#### B. Target Area

Dakchung district in Sekong province

#### C. Implementation System

##### Laos

Implementing organizations: Ministry of Agriculture and Forestry, Provincial Department of Ministry and Forestry, District Office of Agriculture and Forestry, Southern Agriculture and Forestry Research and Extension Center

Cooperating organizations: Local processing companies, Lao National UXO Programme (UXO Lao)

##### Japan

Experts: Cultivation techniques, Post-harvest processing, Organization of farmers/extension, Educational activities

The ODA Project mainly supports coffee cultivation and post-harvest processing by farmers. Both cultivation and post-harvest techniques that SAFREC has accumulated are to be utilized. Extension activities for farmers are to be managed by the District Agriculture and Forestry Office (DAFO) and Provincial Agriculture and Forestry Office (PAFO). Extension workers will be staff members of DAFO. In addition, SAFREC periodically visits sites and supports extension activities, because SAFREC has the capacity to perform training and extension activities. In the second phase, the ODA Project is to cooperate with private companies to provide appropriate techniques of high value-added cultivation. Coffee farming is impossible in areas where UXO remains, so the project is to identify high priority areas for UXO clearance, in cooperation with village, district, and provincial authorities, and to propose the identified areas to UXO Lao. Additionally, the project is to implement educational activities about UXO in order to eliminate risks for farmers getting injured from UXO while coffee farming and to reduce tragedies resulting from the UXO. The educational activities have almost nothing to do with coffee farming but contribute to safe coffee farming. The project is to cooperate with UXO Lao for educational activities, as UXO Lao has the know-how and budget for such education. In areas with inadequate rural infrastructure necessary for coffee cultivation, the project is to request institutions in charge of the infrastructure, in cooperation with village, district, and provincial authorities.

<sup>104</sup> Average price of Catimor cherries of Dao Heuang Group, mentioned by a person of Dao Heuang Group working for the purchase of cherries.

## D. Project Design Matrix (PDM)

Project title: Project for Strengthening Coffee Cultivation and Supporting Post-Harvest Processing in Sekong Province

Project period: Five years

Target area: Dakchung district in Sekong province

Target group: Farmers cultivating coffee and newly starting coffee cultivation

Implementing organizations: Ministry of Agriculture and Forestry, Provincial Department of Agriculture and Forestry, District Office of Agriculture and Forestry, Southern Agriculture and Forestry Research and Extension Center

Narrative summary		Assumptions
<b>Overall Goal</b> 1-1. Yield, the number of farmers, size of cultivation areas, and production increase. 1-2. The number of farmers who produce high-quality coffee, and production of high-quality coffee increase. 2-1. The number of farmers practicing postharvest processing, and production of parchment of high price increase.		
<b>Project Purposes</b> 1-1. Yield increases. Disease is prevented. 1-2. High-quality coffee is harvested and shipped by farmers. 2-1. Parchments processed by farmers are shipped and sold for a high price by farmers. 3-1. The number of victims of UXO decreases.		- Public Project 1 is launched. In other words, Laotian government removes UXO. - Public Project 2 is launched. In other words, Laotian government develops rural infrastructure.
<b>Outputs</b> 1-1. Cultivation technique of farmers improves. 1-2. High-value added cultivation technique of farmers improves. 2-1. Postharvest technique of farmers improves. 3-1. Understanding of farmers about UXO improves.		- Private Project 1 is launched. In other words, Laotian processing companies purchase coffee cherries and parchments. - Private Project 2 is launched. In other words, Japanese companies purchase coffee green beans from Laotian companies.
<b>Activities</b> 1. Activities on cultivation 1-1. Determine model areas 1-2. Conduct training of trainers (TOT) to extension staff 1-3. Organize farmers in model areas 1-4. Train farmers on cultivation in model areas by training courses, follow-up activities, etc.  2. Activities on postharvest processing 2-1. Select farmers groups that practice postharvest processing 2-2. Conduct training of trainers (TOT) to extension staff 2-3. Train farmers on postharvest processing in model areas by training courses, follow-up activities, etc.  3. Educational activities on UXO 3-1. Conduct educational activities on UXO to enhance farmers' understanding of UXO	<b>Inputs</b> <b>Japanese side</b> - Experts (cultivation techniques, post-harvest processing, organization of farmers/extension, education activities) - Equipment (motorbikes) - Expenditure for project activities (including subsidy for seedlings and post-harvest processing machines)  <b>Laotian side</b> - Counterparts at MOAF, PAFO, DAFO, and SAFREC) - Building and facilities - Local cost for the project	<b>Preconditions</b>

### Activity 1-1. Determine model areas

Considering the current situation of coffee cultivation, spare areas to expand coffee farms, priority of local authorities, situation of UXO and defoliants, and situation of infrastructure, ODA Project determines model areas for coffee cultivation. Lands where UXO have not yet been cleared are to be excluded from the model areas, because farming in the lands endangers farmers' lives. Furthermore, areas where defoliants were scattered are to be omitted from model areas, because the effects of the residues have not yet been clarified. The areas where UXO is not yet cleared and where defoliants are scattered are explained in 7.1.6.



Although potential areas appropriate for coffee cultivation spread across Dakchung district, according to the Provincial Department of Investment and Planning of Sekong province, the Sianglouang village-cluster is likely to be the first candidate for the model area. The reasons are that the village-cluster has six villages where coffee farming is better cultivated than in the other villages, and that the six villages are located along Route 16. Coffee farming in the six villages is so active and successful that farmers in other villages are encouraged. However, the farming has room for improvement. JICA survey team thinks that it is probably effective to expand coffee cultivation from the village-cluster to other areas. The location and general information are described in Table 7-1.



Figure 7-2 Dakchung District and Sianglouang Village Cluster

Table 7-1 General Description of Sianglouang Village Cluster

Item	Summary
Population	468 persons, 56 households
Livelihood	Rice, coffee, corn, and cucumber are cultivated. Cash crops are only coffee, because other cash crops cannot be sold owing to limited traffic accessibility; other cash crops are also for domestic consumption. Some farmers ceased cultivation of coffee and started rice farming, because they think rice is accompanied with lower risk than coffee.
Coffee cultivation	Coffee cultivation started in 1987. Middlemen began to appear in 2005, which encouraged coffee cultivation. There are seven experienced farmers in the coffee industry. Each of them has two ha of coffee farms.
Coffee sale	Middlemen irregularly come to villages → They inform village chiefs that they buy coffee cherries and green beans → Village chiefs call for farmers → Middlemen buy coffee by cash
Challenge of coffee cultivation perceived by farmers	- Coffee cultivation techniques - Cultivation of coffee and rice at the same time - Countermeasure on spots, hail, worms, and insects
Traffic access	It takes two to three hours and four liters of petrol to drive by motorbike from the district to the center of Sekong province. Driving in rainy season is impossible.

Source: JICA survey team based on site visit

Activity 1-2. Conduct training of trainers (TOT) to extension staff

Activity 1-3. Organize farmers in model areas

Activity 1-4. Train farmers on cultivation in model areas by training courses, follow-up activities, etc.

The ODA Project will transfer cultivation techniques to extension workers (Activity 1-2), organize farmers in model areas (Activity 1-3), and train farmers about coffee cultivation in model areas by training courses and follow-up activities (Activity 1-4).

The project will make use of cultivation techniques that SAFREC has already accumulated. Since

SAFREK has previously conducted training for extension workers and farmers, SAFREK is to take certain responsibility of TOT in the project. SAFREK has 18 staff members who research and teach about growing coffee. Training topics by SAFREK are: (1) what coffee is, (2) how to nurse seedlings, (3) how to grow coffee, (4) how to harvest coffee, and (5) how to perform post-harvest wet and dry processing. A training course developed by SAFREK is one week in duration and consists of class-room lectures and practice. SAFREK has produced a Laotian textbook on coffee.

Staff members of the District Agriculture and Forestry Office of Dakchung district will work as extension workers on the project. The DAFO has 30 staff members according to the PAFO of Sekong province. Staff members of the PAFO and SAFREK will also periodically visit sites to support the extension activities.

The contents of the cultivation techniques to be taught in the first and second periods are basic techniques, such as sustainable and stable farming and anti-disease measures. Those from the third period cover cultivation techniques creating high-value and basic techniques. Since local purchasing companies sometimes specify their own requirements pertaining to quality and cultivation, as well as their own business terms, in order to attain high value-added crop cultivation results, the project is to have ample discussions with purchasing companies and confirm (before the project commences) that the coffee will be purchased by companies. If necessary, the project is to subsidize a portion of expenses for seeds and seedlings.

#### Activity 2-1. Select farmers groups that practice postharvest processing

The project selects farmers' groups that practice post-harvest processing. The groups to be selected are to have sufficient experience, know-how, success, and confidence in coffee cultivation.

#### Activity 2-2. Conduct training of trainers (TOT) to extension staff

#### Activity 2-3. Train farmers on postharvest processing in model areas by training courses, follow-up activities,

Under the same structure as Activity 1-2, 1-3, 1-4, TOT on post-harvest techniques is conducted (Activity 2-2), and extension workers train selected farmers' groups (Activity 2-3).

Post-harvest techniques taught by SAFREK will be utilized in the project. SAFREK is able to perform the lecturing of TOT. The project calls for cooperation with local processing companies that have post-harvest techniques and specify quality standards for parchments.

If necessary, the project will partially subsidize farmers for purchasing machines for post-harvest processing, called de-pulpers. The price of a de-pulper, which has a capacity of 300 kg of cherries per hour, is four million Kip.

#### Activity 3-1. Conduct educational activities on UXO to enhance farmers' understanding on UXO

UXO remains in Dakchung district and injures or kills a few people annually in the district.

A fundamental solution is clearance of the UXO; however, the district is too large to immediately clear the UXO. Therefore, the project is to conduct education activities on how to prevent accidents. UXO Lao has conducted such educational activities, so the project will cooperate and coordinate its activities with UXO Lao.

#### 7.1.4 Private Project 1: Coffee Processing by Local Processing Companies

In Private Project 1, local processing companies will purchase Arabica coffee cherries and parchments from Dakchung district, and the companies will process and sell them to Japanese companies. Besides, processing technology of local processing companies is improved.

In the first phase, the largest processing company, Dao Heuang Group Ltd., will purchase coffee cherries cultivated in Dakchung district. The company has a sizable processing capacity (6,000 tons), and greatly desires as many coffee cherries as can be supplied.

In the second phase, in addition to Dao Heuang Group, other companies that deal with high-valued coffee, such as Sinouk Café, are to purchase high-quality cherries and parchments. Sinouk Café maintains its base in Tatheng district in Sekong province and has shown an interest in Dakchung district.

#### 7.1.5 Private Project 2: Purchase of Laos Coffee by Japanese Companies

In Public Project 2, Japanese companies will purchase and export coffee from Dakchung district to Japan and other foreign countries.

#### 7.1.6 Public Project 1: Removal of Unexploded Ordnance

During the Vietnam Conflict, Laos was the country that was bombed the most in the world.<sup>105</sup> It is said that 80 million pieces of UXO remain in the 17 provinces in Laos. Victims of UXO since 1964 amounted to approximately 50,000 people, 60% of which were killed. Even currently, approximately 300 people are injured or killed by UXO annually. Dakchung district is not an exception. The district is located on the Ho Chi Minh Trail and a considerable amount of UXO still exists in the area. There were 404 UXO-related accidents in the district since 1964, 246 of which were killed. Table 7-2 indicates the UXO

**Table 7-2 Damage of UXO in Sekong Province**

Year	Sekong Province			Dakchung District		
	Death	Injuries	Total	Death	Injuries	Total
2000	2	3	5	1	1	2
2001	3	2	5	0	2	2
2002	0	3	3	n.a	n.a	n.a
2003	0	4	4	0	1	1
2004	7	5	12	n.a	n.a	n.a
2005	4	5	9	1	0	1
2006	1	9	10	1	1	2
2007	2	16	18	0	2	2
2008	0	3	3	0	3	3
2009	6	3	9	1	0	1
2010	0	5	5	0	3	3
2011	3	2	5	3	1	4
<b>Total</b>	<b>28</b>	<b>60</b>	<b>88</b>	<b>7</b>	<b>14</b>	<b>21</b>

Source: Information from NRA

Legend: n.a = not available

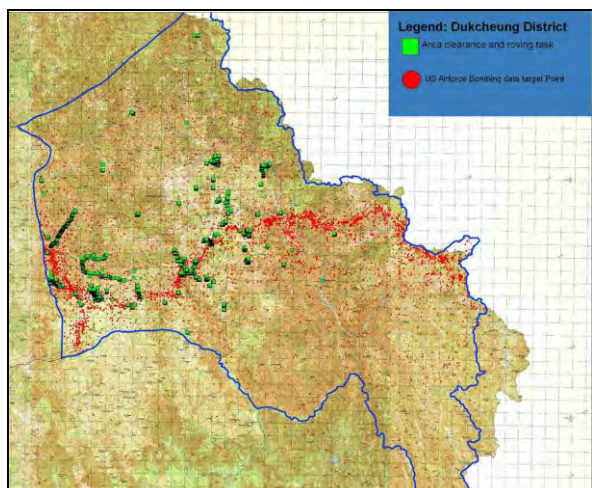
damage since 2000. Unless the areas received UXO clearance services, even areas where farming has been practiced for many years continue to be dangerous. In reality, there have been victims who were injured from UXO bombing exploded while plowing their fields.

Defoliantes were also scattered in the district; however, their residues have never been examined. Thus, it is not known whether coffee cultivated in areas where defoliantes were dropped is safe or not.

In order to solve the above obstacles in the district, the Laotian government will implement Public Project 1, clearing UXO and examining defoliant residues. The implementing agency of clearance of UXO proposed by the JICA survey team is UXO Laos. Since there is no organization responsible for defoliant issues in Laos at this time, the implementing organization for the defoliant issue is to be determined firstly.

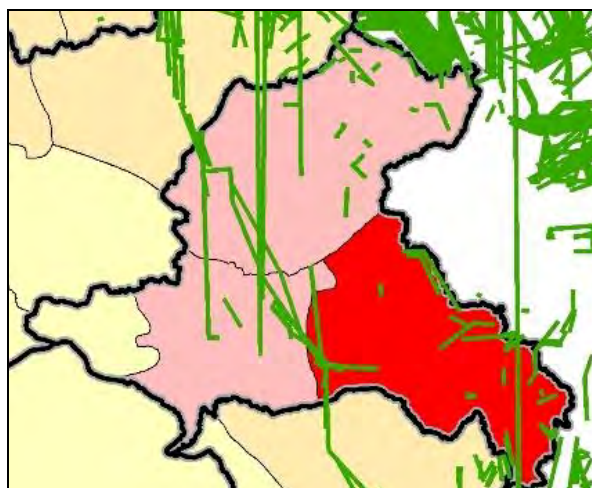
Locations where UXO is supposed to remain and where UXO was cleared are illustrated in Figure 7-3, and areas where defoliantes are supposed to have been scattered are illustrated in Figure 7-4.

<sup>105</sup> In terms of the amount of bombs per capita



Source: National Regulatory Authority for UXO/Mine Action Sector in Lao P.D.R

[Legend] Green: Locations where UXO was removed.  
 Red: Locations where bombs are expected to have been dropped.



Source: National Regulatory Authority for UXO/Mine Action Sector in Lao P.D.R

[Legend] Green: Areas where defoliants are expected to have been scattered.  
 Note: Red-color area is Dakchung district.

Figure 7-3 UXO Locations in Dakchung District      Figure 7-4 Areas of Defoliants in Sekong Province

Table 7-3 summarizes structures for and the situation of UXO clearance. The table indicates that the capacity of UXO Laos to treat UXO is limited. For example, as noted by the UXO Lao Sekong office, UXO Lao can annually clear only 50 ha of land. The Laotian government needs to increase the UXO Lao budget, human resources, and equipment in order to expeditiously and effectively clear the UXO from the focus locations. In case UXO Lao is unable to respond to all the tasks, Laotian government is to consider outsourcing components of the UXO clearance.

Table 7-3 Structure and Situation of UXO Clearance

Item	Structure, situation
Responsible organizations	The National Regulatory Authority (NRA) for UXO/Mine Action Sector in Lao P.D.R (NRA) is responsible for coordination and organization of relevant organizations, companies, and institutions. Lao National UXO Programme (UXO Lao) is responsible for implementing UXO check and clearance.
UXO Lao	Under Ministry of Labor and Welfare Number of personnel: 1,041 persons (2010) Budget: USD \$6,859,494. (2010) Major donors: Japan, the USA, Ireland, etc. Previous performance: UXO Lao has checked and cleared 20,500 ha of land from 1996 to 2010.
UXO Lao Sekong office	Number of personnel at UXO Lao Sekong office: 94 people (2010) Budget: USD \$54,911. (2011) Previous performance: The office has checked and cleared approximately 1,500 ha of land from 1996 to 2010.
Capacity of UXO Lao Sekong office	The UXO Lao Sekong office is capable of examining and clearing UXO in approximately 50 ha of land (information from UXO Lao Sekong office). The necessary time for the examination and clearance depends on the land situation. Dakchung district is located in a mountainous area, and therefore requires a longer time element to execute the plan than in the plains areas.
Cost for check and clearance of UXO	USD \$1,500–USD \$3,000/ha on average in case a private company (not UXO Lao) carries out the plan.
Process to formulate implementation plan on UXO clearance	<ol style="list-style-type: none"> <li>1. Every village proposes locations to be cleared to a district.</li> <li>2. Considering a proposal from every village, every district determines, and proposes, to a province the locations to be cleared.</li> <li>3. Considering the provincial development plan and a proposal from every district, a provincial committee in charge formulates an annual plan through communication with a provincial department of labor and welfare.</li> </ol>
Data on UXO	The NRA accumulates existing UXO information. NRA maintains a database to which areas where UXO has been cleared are referred.

Source: JICA survey team, based on interviews with relevant organizations

### 7.1.7 Public Project 2: Development of Rural Infrastructure

Considering the potential for future coffee production areas and development priorities, the Laotian government will develop rural infrastructure, such as rural roads and water facilities, in areas where traffic accessibility and water irrigation situation are poor. Only 30% of Dakchung district is now able to be accessed by roads. Areas other than along Route 16, which is now being improved and slated for completion by 2015, need to be improved.

## 7.2 Candidate Project-Cluster 2: Promotion of Vegetable Production for Processing in Central and Southern Regions

The labor cost in Thailand is rapidly increasing as the national economy is growing, and Japanese companies that have produced processed (such as frozen) vegetables for the Japanese market are being forced to reconstruct their business strategies. However, some areas in Laos, including Bolaven Plateau, have appropriate climatic conditions to cultivate vegetables usually grown in temperate countries because the areas have relatively high altitude, creating a cool temperature. A Japanese-origin company that has been operating in Thailand for a long time has already started vegetable production on Bolaven Plateau in anticipation of further wages increases in Thailand. The reality in Laos, however, is that a limited number of farmers can provide raw materials stably under contract farming. Stable production of vegetables with a certain quality is a significant challenge in Laos. In addition, it should be noted that young human resources with the knowledge of vegetable production, post-harvest, and processing are particularly limited in Laos.

“Promotion of Vegetable Production for Processing in Central and Southern Regions” is proposed as a candidate project cluster. The cluster involves (1) ODA Project 1: Vegetable Production and Marketing Support Project in Central and Southern Regions, (2) ODA Project 2: Post-Harvest and Food Processing Human Resource Development Project, (3) ODA Project 3: Border Gate Infrastructure Construction Project in Southern Region, and (4) Private Project: Private Processing Factory Construction by Private Investment. Through these projects, vegetables for processing will be produced stably, farm income will be enhanced, and Japanese demand for processed vegetable will be satisfied.

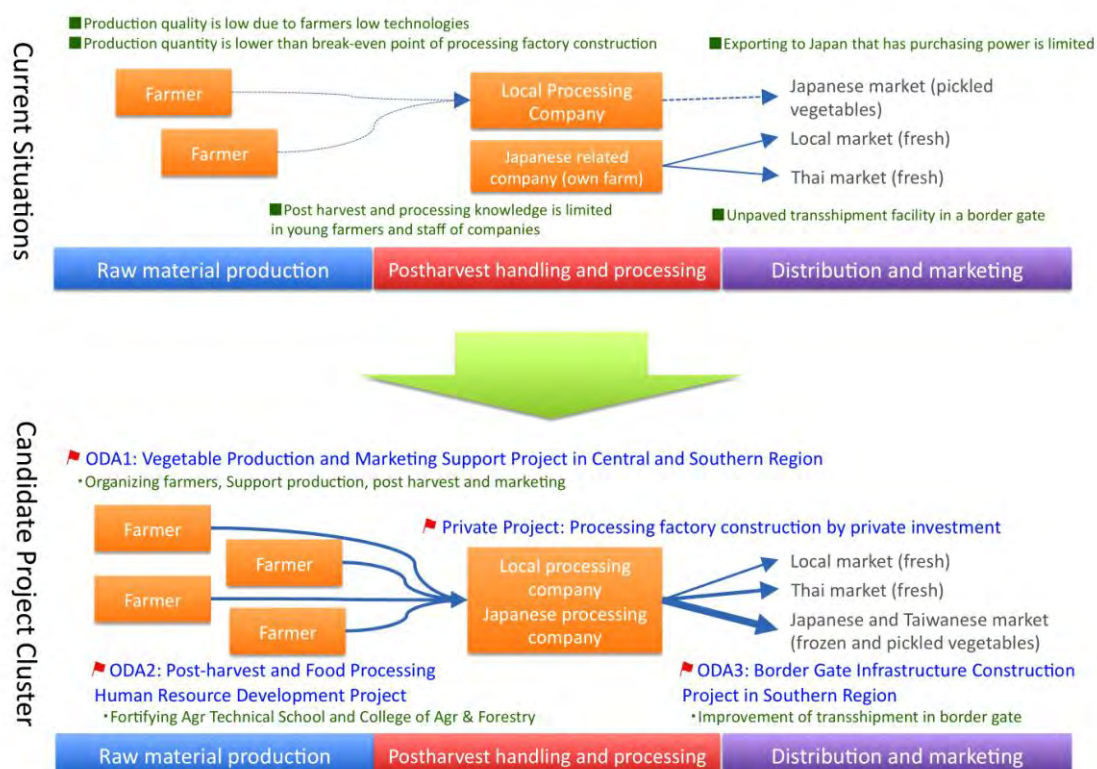


Figure 7-5 Overview of Candidate Project-Cluster 2: Promotion of Vegetable Production for Processing in Central and Southern Regions

## 7.2.1 Background

### A. Rise of Labor Cost in Neighboring Countries

In Thailand, which has been a leading actor in vegetable production for the Japanese market in the modality of development and import among ASEAN countries, wages are going up as the national economy grows. The Yinlac administration, which began in 2011, promised to hike the minimum wage to 300 baht per day. Many Japanese businesses operating in Thailand are concerned about the possible growing labor cost. Labor cost seems to be increasing in Vietnam as well. On the Dalat Plateau, where vegetable production has flourished due to its cool temperature, tourism is rapidly developing to push up wages there. Japanese companies that have produced frozen and dried vegetables for the Japanese market are struggling to determine how to cut down the swelling labor cost. A manager of a Japanese-origin company that has produced frozen vegetables in Thailand said that it will be difficult to produce vegetables at the current low price 10 years from now, considering the economic growth in Thailand.

### B. Ideal Natural Conditions for Vegetable Production on Bolaven Plateau

Bolaven Plateau, which has an elevation of 800-1,200 meters and has a large daily range of temperature, is an excellent place for vegetables native to temperate countries. Cabbage and Chinese cabbage are produced there to export to Bangkok. Depending on elevation and land features, there are suitable places for vegetable production other than Bolaven Plateau in the central and southern regions of Laos.

### C. Movements of Japanese-Related Companies

A Japanese-origin company that has produced frozen vegetables for export to Japan established a local company in Sekong province in southern Laos and is operating its own 60 ha farm. The company is producing vegetables such as asparagus and green beans and discussing the possibility of processing vegetables there for the Japanese market. This is a movement to take advantage of the potential of Laos in advance (see 6.2). Meanwhile, a Laotian company started pickled cucumber production in Khammuane province in the central region based on the request of a Japanese company. They are procuring raw materials through contract farming.

### D. Robust Demand for Processed Vegetables in Japan

Frozen vegetables are consumed widely in Japan for both household and professional use. Frozen young soybeans, green beans, taro, spinach, and potatoes are popular in most supermarkets. According to trade statistics, 800,000 tons of frozen vegetables are imported. Though 70% of this amount is produced in China and the United States, Thailand and Vietnam are in the top ten exporting countries. China has been a vegetable production center for the Japanese market because of its cheap labor cost, but wages are going up as the economy grows. Every year, more than 10 tons of pickled vegetables such as cucumber and ginger are imported to Japan.

### E. Challenges: Human Resources and Border Infrastructure

The Japanese-origin company hired many graduates from Champasack School of Agriculture and Forestry, but their knowledge and skills were not necessarily practical and sufficient for working on the farm. The school became a college under the Ministry of Agriculture and Forestry in 2010 and is now required to be a more advanced educational institute. Moreover, there is another agricultural vocational school in Champasack under the Ministry of Education. Another challenge is that the infrastructure of the border gate from southern Laos to Bangkok needs attention to ensure smooth transshipment.

## 7.2.2 Plan of Candidate Project-Cluster

### A. Mission

There will be an increased number of vegetable-growing farmers in suitable areas, such as Bolaven Plateau, in the central and southern regions of Laos and the areas will be well-known for vegetable production among ASEAN countries. Young human resources for post-harvest and processing industries will be developed and infrastructure for the border gate from southern Laos to Thailand will be constructed. The numerical targets are 2,240 tons of green bean production by 1,000 farm households and 1,500 tons of cucumber by 500 farm households.

### B. Target Area

Vegetable production will be implemented on Bolaven Plateau and areas with similar conditions. In terms of human resource development for post-harvest and food processing, the pilot sites are the Champasack College of Agriculture and Forestry and the Champasack Agricultural Technical School. The target of border infrastructure construction is Vang Tao border in Champasack.

### C. Outline

Farmers produce vegetables of the demanded quality through contract farming for Japanese businesses. Japanese businesses purchase and process the vegetables to sell in the Japanese market. This is the basic structure of the candidate project cluster.

The kinds of vegetables should be high-value-added types under intensive crop management rather than mechanized mass production in large-scale areas. The cheap labor costs in Laos are advantageous for these kinds of vegetables. Green beans for frozen processing and cucumber for pickled processing will be cultivated.

As the labor-intensive vegetables require a high level of crop growth management capacity, and the quality requirement is higher in Japan than in other countries, it takes time to train farmers.

A core farmer organizes about 20 farmers, and a Japanese-related business or local partner company purchases vegetables from the core farmer and processes them. The vegetable production and marketing support project using ODA will continue for four years. Until production reaches the minimum amount for investment by a Japanese-related company, the ODA project covers the financial aspect, organizing farmers, production technology transfer, and marketing. In the initial stage of the ODA project, farmers and a Japanese business or local partner will conclude a preliminary agreement in which both sides will agree to make a contract if production reaches the planned scale, witnessed by the Provincial Planning Department and Provincial Agriculture and Forestry Office. In the beginning of the fourth year, if production can be expected to reach the planned level, farmers should make contracts with Japanese companies and sell their products through core farmers. The ODA project finishes at this time and the contracted Japanese company becomes responsible for organizing farmers and marketing their products.

Young human resource development will be implemented through an ODA technical cooperation project for three years. The project will support curriculum development and text production to fortify the area of post-harvest technology and food processing, working with the Ministry of Education and the Ministry of Agriculture. The pilot sites are two agricultural schools in Champasack. Young human resources with practical knowledge and skills will be built up and engage in agricultural production as leading farmers as well as staff of related companies. The border infrastructure construction project will cover paving the transfer site at Vang Tao border.



## D. Price Information

### (1) Picked Cucumber

Pickled cucumber is processed in two stages, pre-pickling and main pickling, using 8 pickling tanks of 2 m by 2 m by 2 m each. Suppose that a farm household cultivates 1 rai (0.16 ha) and the target production amount is 19 tons, with 6 farm households sharing 8 pickling tanks. If they harvest twice a year and the unit price is 1,200 Kip/kg, annual sales are USD 900. As the construction cost of 8 pickling tanks is about USD 6,000, each household would need to pay USD 1,000. If they set 5 years as the payback period, the annual amount becomes USD 200. They can pay this out of the USD 900 even after paying some other costs such as seeds. Pickling tanks are made of concrete and last more than 10 years. After 5 years, farmers can enjoy an additional profit of USD 200 every year.

From the processing company's point of view, more than 1,000 tons of raw cucumber is the break-even point, according to a Japanese company in the industry. One thousand, five hundred tons of cucumber from 500 farm households, therefore, is set as the target amount for the ODA project.

### (2) Frozen Green Beans

Based on interviews with Japanese frozen vegetable production companies in Thailand and Vietnam, the break-even point of a frozen vegetable factory is as follows.

Case 1: Large-scale frozen processing factory with automated blancher

Equipment investment	JPY 400,000,000
Break-even point	2,500 tons of product and 5,000 tons of raw materials per annum

Case 2: Medium-scale frozen processing factory with manual blancher

Equipment investment	JPY 100,000,000
Break-even point	1,000 tons of product and 2,000 tons of raw materials per annum
Production capacity	2,000 tons of products per annum

#### Assumptions

Equipment investment is procured by loan and the processor pays only interest without paying back principal. The interest rate is 10% per annum.

- A: Current profit = Sale – Current cost
- B: Sale = Unit price × Production amount
- C: Current cost = Variable cost + Fixed cost
- D: Variable cost = Cost coefficient × Production amount
- E: Fixed cost = Loan interest = 10% of equipment investment

Consequently:

Current profit = (Unit price – Cost coefficient) × Production amount – 10% of equipment investment

Figure 7-6 below shows the current profit by production amount. A medium-scale factory cannot produce more than 200 tons per annum. A large-scale factory is required to produce more than 2,500 tons to reach break-even.

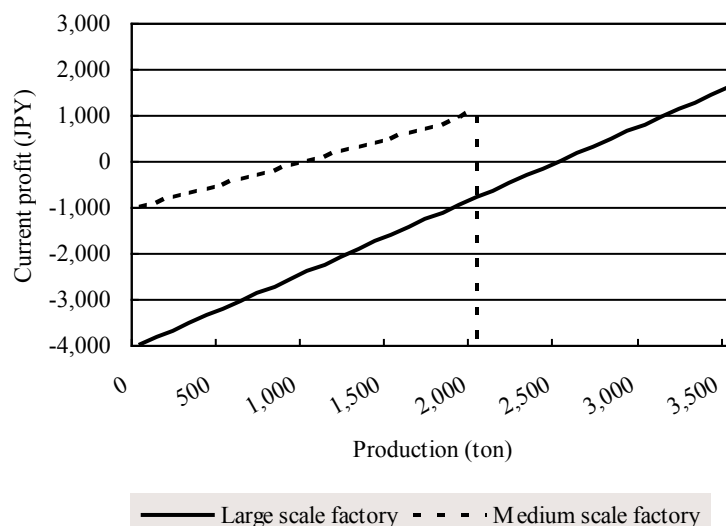


Figure 7-6 Profit and Loss of a Frozen Vegetable Factory

From discussion above, 2,240 tons of raw materials from 1,000 farm households was set as the target for the green bean production of the ODA project. This is more than 2,000 tons to be more than the break-even point for a medium-scale frozen vegetable factory.

#### E. Pre-Conditions for Involvement of Japanese-Related Companies

When Japanese companies take part in this project cluster, the following two conditions should be met. First, companies do not have any responsibility to make contracts with farmers if the farmers cannot achieve the target production amount. Second, companies do not have any responsibility to market raw vegetables produced during the ODA period. Instead, the ODA project is responsible for marketing the vegetables produced. In short, companies do not take on any risk during the ODA project period. Otherwise, private companies cannot participate in the proposed project cluster.

On the other hand, companies involved in the project cluster should demand vegetables of certain specifications when they make contracts with farmers. It is more logical for farmers to get training on growing the specific vegetables during the ODA project. In this case, companies need to share some costs, such as seeds, with the ODA project. This can be included in the preliminary agreement.

When the production capacity of farmers starts growing, the ODA project will sell their products at the highest prices possible under free marketing conditions. However, if socioeconomic conditions at that time are not as good as expected, products may not be able to be marketed at all. It is safer to have a preliminary agreement from the beginning with specific Japanese companies that have robust markets to assure marketing channels.

The ODA project needs to minimize marketing risk, as it is responsible for marketing the cucumber and green beans produced by targeted farmers. Cucumber and green beans are selected for future processing by Japanese-related companies, considering their high potential to be sold fresh in local markets at the same time.

### 7.2.3 ODA Project 1: Vegetable Production and Marketing Support Project in Central and Southern Regions

#### A. Scheme

Technical Cooperation Project

#### B. Target Area

Cucumber: Sebangfai district and neighboring districts, Khammuane province

Green beans: Bolaven Plateau

#### C. Implementation System

Laos: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office, District Agriculture and Forestry Office

Japan: Experts on production management/traceability, farmer organizing, marketing, cucumber production, and green bean production

## D. Project Design Matrix (PDM)

Project title: Vegetable Production and Marketing Support Project in Central and Southern Regions

Duration: Five years

Target areas for cucumber: Sebangfai district and neighboring districts, Khammuane province

Target areas for green beans: Bolaven Plateau

Target group: Farm households producing cucumber or green beans

Implementation agencies: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office, District Agriculture and Forestry Office

Narrative Summary	Important assumptions	
Overall goal Japanese-related companies invest in the processing of pickled cucumber or frozen green beans		
Project purpose Farm households produce 1,500 tons of cucumber and 2,240 tons of green beans		
Outputs 1-1. Core cucumber farmers master cucumber growing technologies 1-2. General cucumber farmers master cucumber growing technologies 2-1. Core green bean farmers master green beans growing technologies 2-2. General green bean farmers master green beans growing technologies		
Activities 1-1. Determine 25 core cucumber farmers (CCFs). 1-2. Set up a cucumber demonstration farm and train CCFs on cucumber growing technologies. 1-3. CCFs grow cucumber in their own farms in parallel with the training. 1-4. Monitor CCF cucumber production. 2-1. Each CCF organizes 20 general cucumber farmers (GCFs) (25 × 20 = 500). 2-2. Each CCF trains GCFs organized in the CCF's farm on cucumber growing technologies. 2-3. GCFs grow cucumber in their own farms in parallel with the training. 2-4. GCFs grow cucumber in their own farms constantly (3 tons/0.16 ha × 500 = 1,500 tons). 3-1. Determine 50 core green bean farmers (CGFs). 3-2. Set up a green bean demonstration farm and train CGFs on green bean growing technologies. 3-3. CGFs grow green beans in their own farms in parallel with the training. 3-4. Monitor CGF green bean production. 4-1. Each CGF organizes 20 general green bean farmers (GGFs) (50 × 20 = 1,000). 4-2. Each CGF trains GGFs organized in the CGF's farm on green bean growing technologies. 4-3. GGFs grow green beans in their own farms in parallel with the training. 4-4. GGFs grow green beans in their own farms constantly (1.12 tons/0.16 ha × 1,000 = 2,240 tons).	Inputs Japan: <ul style="list-style-type: none"> <li>• Experts in production management/traceability, farmer organizing, marketing, cucumber production, green bean production</li> <li>• Operational costs</li> </ul> Laos: <ul style="list-style-type: none"> <li>• Counterpart in Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office, District Agriculture and Forestry Office</li> <li>• Office and its equipment</li> <li>• Recurrent cost</li> </ul>	Pre-conditions

Activity 1-1. Determine 25 core cucumber farmers (CCFs)

Activity 1-2. Set up a cucumber demonstration farm and train CCFs on cucumber growing technologies

Activity 1-3. CCFs grow cucumber in their own farms in parallel with the training

Activity 1-4. Monitor CCF cucumber production

Start the project by finding CCFs in Sebangfai district and neighboring districts, Khammuane province, where cucumbers for pickling are already produced. CCFs, who may be newly starting

farmers or already producing farmers, have to have a strong willingness to train 20 farmers on production technologies and to sell their products to the project or other agreed-upon places. Through a demonstration farm set up by the project, 20 CCFs should master how to grow cucumber first. At the same time, they cultivate cucumber at their own field. They should produce two crops a year. The produced cucumbers will be sold in local markets by CCFs themselves with the support of the project.

Activity 2-1. Each CCF organizes 20 general cucumber farmers (GCFs) ( $25 \times 20 = 500$ )

Activity 2-2. Each CCF trains GCFs organized in the CCF's farm on cucumber growing technologies

Activity 2-3. GCFs grow cucumber in their own farms in parallel with the training

Activity 2-4. GCFs grow cucumber in their own farms constantly ( $3 \text{ tons}/0.16 \text{ ha} \times 500 = 1,500 \text{ ton}$ )

In the second year, a CCF organizes 20 GCFs and train them in the CCF's own cucumber fields. GCFs practice cucumber production in their fields at the same time.

Activity 3-1. Determine 50 core green bean farmers (CGFs)

Activity 3-2. Set up a green bean demonstration farm and train CGFs on green bean growing technologies

Activity 3-3. CGFs grows green beans in their own farms in parallel with the training

Activity 3-4. Monitor CGF green bean production

Activity 4-1. Each CGF organizes 20 general green bean farmers (GGFs) ( $50 \times 20 = 1,000$ )

Activity 4-2. Each CGF trains GGFs organized in the CGF's farm on green bean growing technologies

Activity 4-3. GGFs grow green beans in their own farms in parallel with the training

Activity 4-4. GCFs grow green beans in their own farms constantly ( $1.12 \text{ tons}/0.16 \text{ ha} \times 1,000 = 2,240 \text{ tons}$ )

As target areas for green bean production have not been determined, the project should select relevant project sites for green bean production around Bolaven Plateau. After target areas are fixed, the project will select 50 CGFs in the third year to train on the demonstration farm. In the fourth year, each CGF organizes 20 GGFs and starts training. The extension system is the same as in the cucumber case.

#### 7.2.4 ODA Project 2: Post-harvest and Food Processing Human Resource Development Project

##### A. Scheme

Technical Cooperation Project

##### B. Target Area

Nationwide, Champasack province for pilot activities

##### C. Implementation System

Laos: Vocational Training Development Center, Ministry of Education; Human Resource Department, Ministry of Agriculture and Forestry; Champasack Agricultural Technical School; Champasack College of Agriculture and Forestry

Japan: Experts on curriculum development, material production/training, and food processing/hygiene management

## D. Project Design Matrix (PDM)

Project title: Post-Harvest and Food Processing Human Resource Development Project

Duration: Three years

Target areas: Nationwide, Champasack province for pilot activities

Target group: Teachers in agricultural technical schools and the College of Agriculture and Forestry

Implementation agencies: Ministry of Education, Ministry of Agriculture and Forestry

Narrative Summary	Important assumptions	
<p><b>Overall goal</b> More than 30% of graduates who go through the developed curriculum on post-harvest and food processing get jobs in agricultural and food-related industries.</p>		
<p><b>Project purpose</b> Develop curriculum on post-harvest and food processing in agricultural technical schools and the College of Agriculture and Forestry.</p>		
<p><b>Outputs</b> 1. Develop curriculum on post-harvest and food processing. 2. Test the curriculum at the two pilot schools in Champasack. 3. Improve the curriculum based on lessons learned at the pilot schools and disseminate it nationwide.</p>		
<p><b>Activities</b> 1-1. Form a task team in the Vocational Training Development Center to develop curriculum. 1-2. The team develops teaching materials for the new curriculum. 2-1. The team trains teachers in the pilot schools. 2-2. Trained teachers instruct students based on the developed curriculum. 3-1. The team improves the curriculum and materials based on the experiences in the pilot schools. 3-2. The Vocational Training Development Center under the Ministry of Education and Human Resource Department of the Ministry of Agriculture and Forestry disseminates the developed curriculum and teaching materials to other schools in the country.</p>	<p><b>Inputs</b> Japan:  <ul style="list-style-type: none"> <li>• Experts in curriculum development, material production/training, food processing/hygiene management</li> <li>• Operational costs</li> </ul> Laos:  <ul style="list-style-type: none"> <li>• Counterpart in Ministry of Agriculture and Forestry, Ministry of Education</li> <li>• Office and equipment</li> <li>• Recurrent cost</li> </ul> </p>	<p><b>Pre-conditions</b></p>

### 7.2.5 ODA Project 3: Border Gate Infrastructure Construction Project in Southern Region

Vang Tao border gate is important for agriculture in southern Laos, because agricultural products are exported through the border in most cases. Fresh vegetables produced in the south, especially at Bolaven Plateau, are transported to the border by Laotian trucks, transshipped to Thai trucks, and sold or processed into frozen vegetables in Thailand.

Although Van Tao border gate is imperative for agriculture in the south, the area for transshipment and parking is not paved, so the ground becomes muddy and hinders efficient transshipment in the rainy season. Therefore, the JICA survey team proposes a grant-in-aid project to pave the place.

#### A. Scheme

Grant-in-Aid Project

#### B. Target Area

Vang Tao border gate in Champasack province

#### C. Implementation System

Implementing organization: Department of Customs, Ministry of Finance

#### D. Project Design Matrix (PDM)

Project Title: Border Gate Infrastructure Construction Project in Southern Region

Duration: Six months

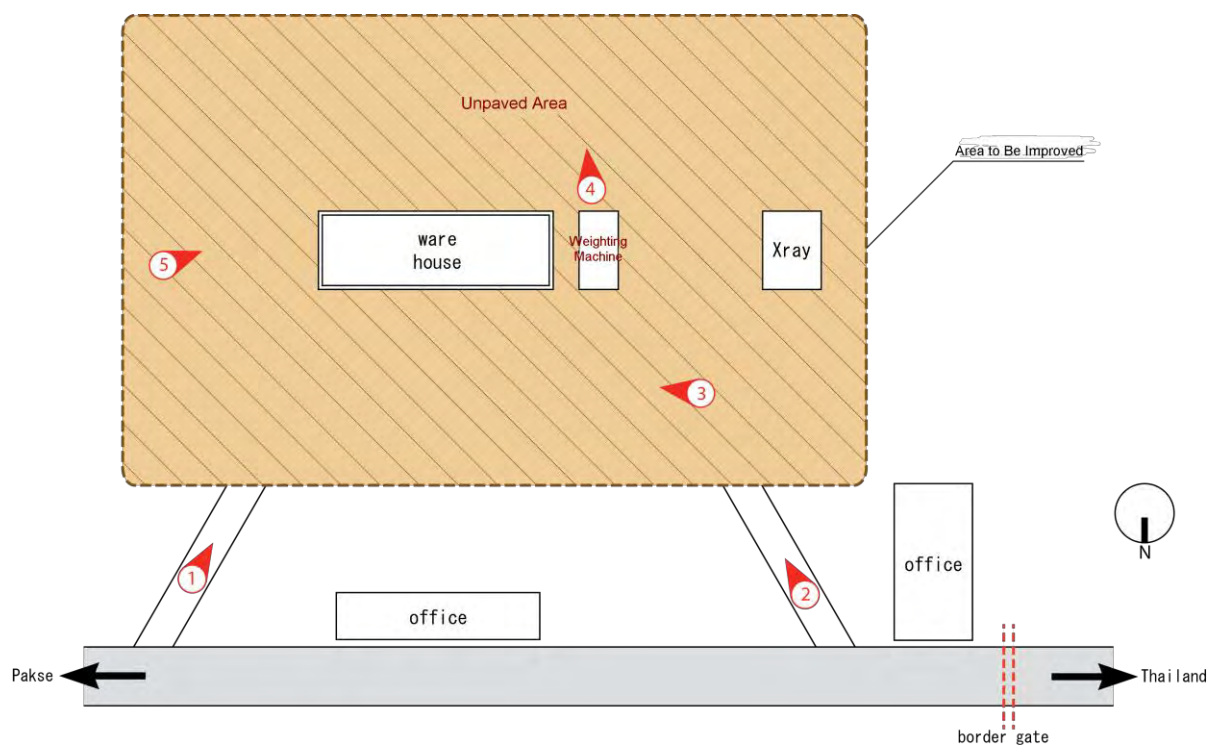
Target area: Vang Tao border gate in Champasack province

Target group: Importers and exporters

Implementing organization: Department of Customs, Ministry of Finance

Narrative summary		Assumptions
Overall goal 1. The amount of import and export through Vang Tao border gate increases.		
Project purpose 1. Transshipment is carried out efficiently.		
Outputs 1. The area for transshipment is paved.		
Activities 1. Clear, level, and pave the area for transshipment	Inputs Japan: - Construction cost: 88–129 million yen  Laos: - Personnel in charge of design and construction supervision	Pre-conditions

The present situation in the area is illustrated in Figure 7-7. The area for transshipment and parking is located around a warehouse. The pictures in Figure 7-7 demonstrate that as of August 2011, the ground was unpaved and muddy and had puddles.



Picture 1: Area for transshipment. Puddles can be seen.



Picture 2: Area for transshipment. The ground is muddy.



Picture 3: Area for transshipment. A person transships cargo in the muddy ground.

Figure 7-7 Map and Pictures of Vang Tao Border Gate

### 7.2.6 Private Project: Private Processing Factory Construction by Private Investment

As explained in E in 7.2.2, if more than the amount of raw materials required to reach the break-even point of factory construction are produced, companies can build pickling or frozen vegetable factories. Besides entering into contracts with farmers, the companies construct factories.



### 7.3 Candidate Project-Cluster 3: Rice Mill Modernization for High-Quality Non-Glutinous Rice

Laotian rice production has been centered on food security and characterized by low productivity and low milling technology. Today, the government of Laos PDR has a policy of promoting irrigation agriculture development in major plains located in Vientiane, Borikhamxay, Khammuane, Savannakhet, Attapeu, and Champasack provinces, and the Vientiane capital. The study team proposes a project-cluster for “Rice Mill Modernization for High-Quality Non-Glutinous Rice” to produce high-quality non-glutinous rice by establishing medium-scale modern rice mills equipped with high-efficiency, sophisticated rice mill processing machinery and equipment manufactured and supplied by Japanese-owned firms known for high technology in the field of rice processing. This project cluster will allow non-glutinous rice, especially improved Jasmine rice, to be exported to Europe, the Middle East, and neighboring countries of Southeast Asia. Thus, a rice production industry designed for self-sufficiency can be converted into rice export industry by introducing Japanese processing technology. The project cluster consists of (1) irrigation agriculture investments by the public sector, and (2) modernization of rice mill investments by the Laotian private sector.

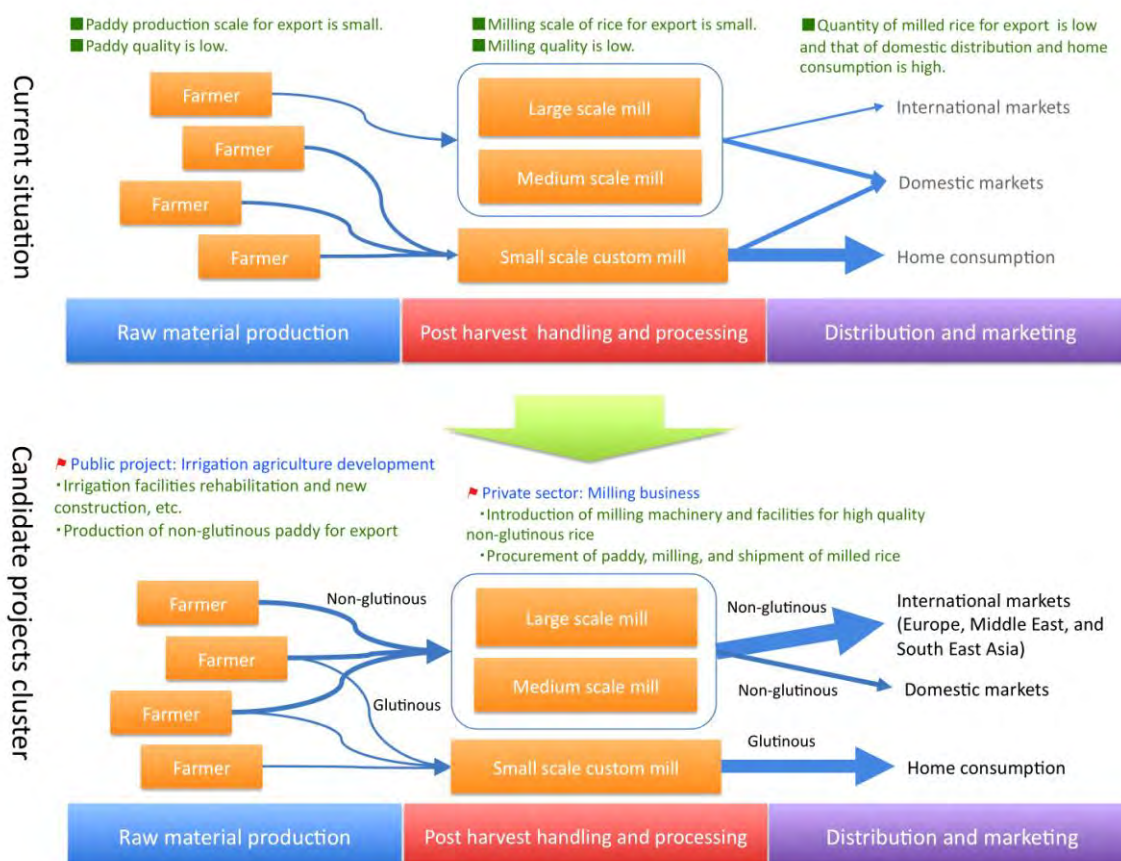


Figure 7-8 Overview of Candidate Project-Cluster 3: Rice Mill Modernization for High-Quality Non-Glutinous Rice

### 7.3.1 Background

#### A. Need for Rice Production Increase and Modernization of Rice Mills

While the government of Laos has implemented policies for food security, irrigation agriculture development is one of the key strategies described in the Strategy for Agricultural Development 2011-2020. Irrigation agriculture development involves not only rehabilitation and new development of irrigation facilities but also modernization of rice processing facilities by establishing cereal storage, introducing milling machinery, and so forth.

According to the Department of Planning in the Ministry of Agriculture and Forestry (MAF), the set target for paddy production under the current policy is 4,200,000 tons by 2015; the department would like the country to export rice from 100 tons of paddy. To achieve this goal, the Department of Irrigation, MAF disclosed a plan to increase irrigation areas from 200,000 ha to 350,000 ha in the dry season by 2015.

Looking at demand for non-glutinous rice, export of the rice to Europe is stable and will increase in future, especially to France, where many Laotians live. Moreover, the Laotian government would like to invite investment from the private sector in the rice industry to expand rice exports to the Middle East and neighboring Southeast Asian countries. However, imported rice inflows to urban cities from neighboring countries; therefore, increasing rice production and promoting rice processing are urgent issues to address. In addition, every year, floods damage rice production, and approximately 150,000-190,000 tons paddy are lost. Paddy production for the country's food stock is also an important issue.

#### B. Markets for Non-Glutinous Rice and Milling Machinery

As mentioned, non-glutinous rice is exported to Europe, and especially to France. Meanwhile, rice imports from neighboring countries are seen, so alternative rice production against imports is awaited. Demand for milling machinery is high because private entrepreneurs would like to invest in the rice-processing industry and export non-glutinous rice. Moreover, some millers would like to renew existing milling facilities by introducing high-efficiency milling machinery to produce high-quality milled rice. If irrigation agriculture development is activated, those investors' anticipation of producing high-quality rice will be greater; thus, opportunities will increase in the milling business. In particular, this development is expected to increase the consecutive businesses of paddy procurement, milling, grading and packaging, and selling milled white rice.

#### C. Policies Supporting Laotian Non-Glutinous Rice Production

In the country, there are seven major plains where rice production is practiced, located in Vientiane, Borikhamxay, Khammuane, Savannakhet, Attapeu, and Champasack provinces, and the Vientiane capital. In addition to these areas, 14 other plains are suitable for rice cultivation. The government has plans for irrigation agriculture development in the potential locations, which will expand irrigation areas to 350,000 ha by 2015.

The government's policy makes the Vientiane capital and Vientiane province high-priority locations for developing irrigation agriculture so that production of non-glutinous rice will account for 80% of the total rice production of the irrigation areas in these two locations.<sup>106</sup> Non-glutinous rice is cultivated mainly for export purposes. Thai Hom Mali Rice, also called Jasmine Rice, normally yields 2 tons/ha. Productivity of the improved varieties grown in Laos, Hom Savanh, and Hom Santhong, is between 4 and 5 tons/ha; thus, the two non-glutinous rice varieties are sold at a comparatively high price. The aroma of these two varieties is inferior to that of Thai Hom Mali Rice;

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<sup>106</sup> Interview with the Department of Irrigation, MAF (October 17, 2011).

however, the people of Europe and the Middle East do not care about aroma, so export of the two rice varieties has varieties has no constraints.

Exporters of highly marketable non-glutinous rice, improved Jasmine, exist today in the country, and some millers would also like to start export businesses for non-glutinous rice. Moreover, some private firms are starting new milling business for rice exports, as introduced in Chapter 6.

#### D. Incentives for Japanese-Owned Firms to Supply Milling Machinery and Milling Systems

Demand for rice is increasing worldwide, especially in Southeast Asia and Africa. The rice production of Laos, Myanmar, and Cambodia will increase dramatically, though that of Thailand and Viet Nam will not increase, according to the analysis of a Japanese manufacturer of milling machinery and peripheral equipment.<sup>107</sup> Therefore, as demand for high-quality milled rice increases, Japanese manufacturing companies would like to expand their international market share of milling machinery appropriately designed for long-grain rice, which is the majority of rice in the world.

#### E. High Technology Level of Japanese-Owned Milling Machinery Manufacturers

Milling technology in Laos PDR is low so that it cannot process paddy into quality milled rice that meets international requirements for export. Rice should not include too much broken grain. If the recovery of head rice is low, a stable profit cannot be expected. Japanese manufacturers and Japanese-owned firms in Southeast Asian countries produce and sell high-quality milling machinery and have milling plants to produce exportable milled white rice. Japanese-made milling machinery is highly evaluated by users in the world due to its performance; for instance, milling recovery and head rice recovery using the Japanese machinery are 65-66% and 50-55%, respectively. On the other hand, milling recovery and head rice recovery by Laotian medium- and small-scale rice mills as disclosed during the study are 60-63% and 30.5-31.5%, respectively. Thus, Japanese machinery excels in milling performance.

### 7.3.2 Plan of Candidate Project-Cluster

#### A. Mission

In line with irrigation agriculture development through government public investment, private sector investments in modernized medium-scale milling business will increase rice production and promote exports of Laotian rice. Hence, the socioeconomic situation of the country will improve. In the process of milling, the rice value chain is strengthened and the income of stakeholders in the chain is improved. The set target for the irrigation area is 350,000 ha. Thus, annual paddy production will be increased to 4,200,000 tons by 2015. Rice for export will use some 1,000,000 tons of paddy,<sup>108</sup> and 550,000 tons of improved Jasmine rice will be exported.<sup>109</sup>

#### B. Target Area

The MAF proposes irrigation agriculture development areas by 2015 as shown in Figure 7-9.

<sup>107</sup> Interview with a Japanese manufacturer of milling machinery (July 11, 2011)

<sup>108</sup> Interview with the Department of Planning, MAF (August 8, 2011)

<sup>109</sup> If 1,000,000 tons of non-glutinous paddy are destined for export and head rice recovery is 55%, 550,000 tons of white rice can be produced.

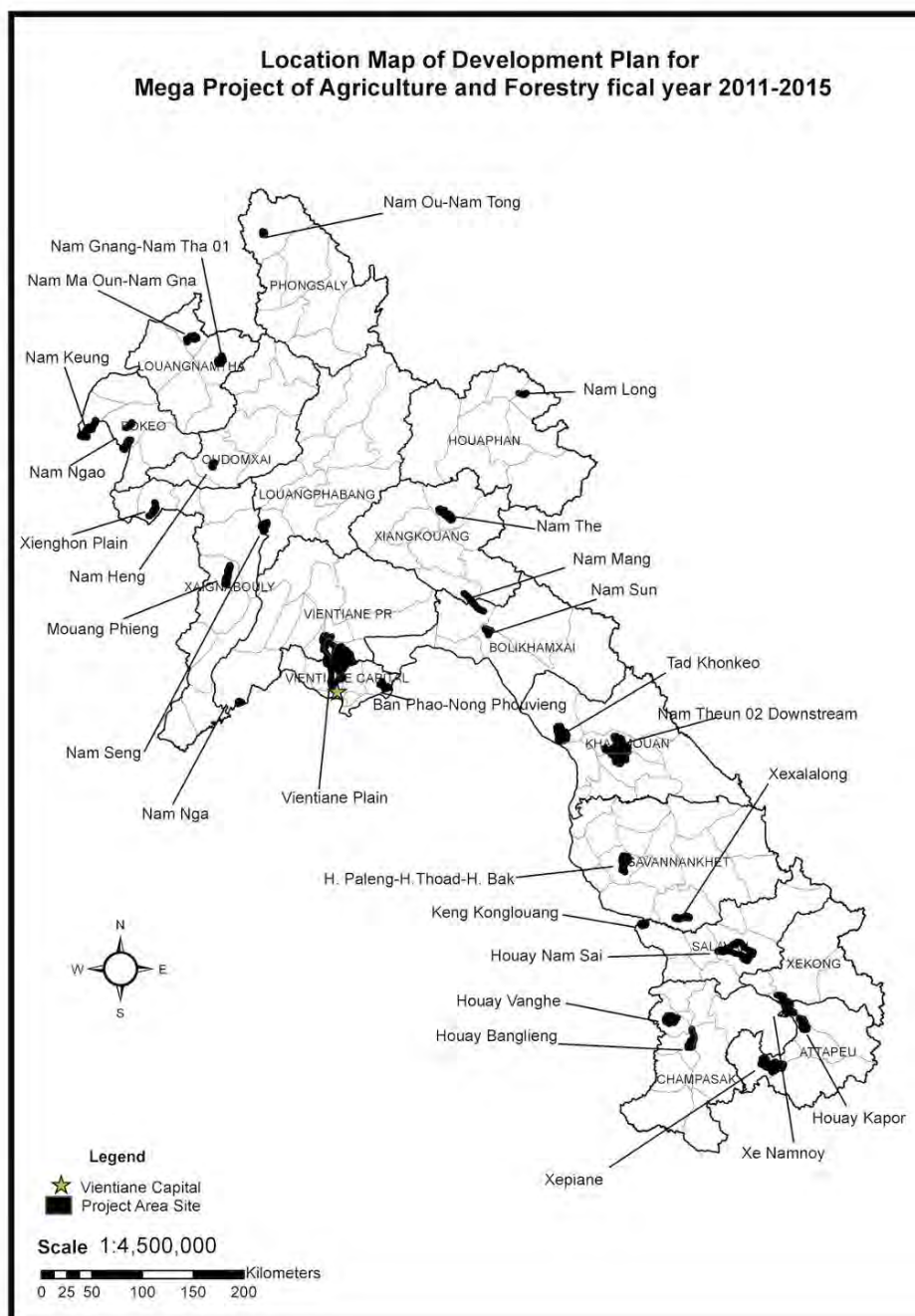


Figure 7-9 Proposed Irrigation Agriculture Development Areas (2011–2015)

Proposed areas for irrigation agriculture development are located in 27 areas of the nation.<sup>110</sup> If development projects are undertaken in each area, opportunities for the private sector to invest in the milling business will surely increase.

According to the Department of Irrigation, some mega-scale projects have irrigation scheme areas of more than 2,000 ha, for example, (1) Nam Theun 02 Downstream in Khammuane province, (2) 15,000 ha of irrigation in Sekong province, (3) Nam Ngum Right Bank Irrigated Agriculture Project with 19,000 ha in the Vientiane capital, and (4) Nam Ngum Left Bank Irrigated Agriculture Project

<sup>110</sup> Some proposed development projects are named mega-projects. They are projects that have a target area of more than 1,000 ha in the north and more than 2,000 ha in the central area and the south. Moreover, the projects include multiple industries, like paddy production, processing, aquaculture, and livestock.

with 6,000 ha in Vientiane province. The department gives high priority to (3) and (4), which will be model projects for promoting the export of rice.

### C. Outline

The project cluster consists of two aspects: (1) irrigation agriculture development projects through investment by the government, and (2) modernization of the milling business through investment by the private sector. The Laotian government has secured the budget to implement the irrigation agriculture development and set the priority areas.<sup>111</sup> The MAF produces paddy seeds and distributes them to farmers. Farmers practice paddy production in the irrigation scheme and make an effort to increase production following the technical instructions provided by the current extension system of MAF. The capacity of and specifications for storage and milling facilities can be designed based on target irrigation areas and expected annual production of paddy. Then, new investors and current millers will procure milling machinery and milling systems from Japanese-owned manufacturers to start rice-milling and export businesses.

### D. Major Issues

Nowadays, milled rice processed in Laos does not meet the quality requirements for export. Much broken rice is produced owing to low head rice recovery, other impurities are found, non-glutinous and glutinous rice are mixed, and different varieties are mixed. The quality of rice is determined by the selection of seeds before planting and farm work such as harvesting, threshing, and drying at the production stage. Thus, problems with mixture of varieties and different kinds of rice, non-glutinous and glutinous, can be solved during the process of paddy production.

If the quality of paddy produced by farmers is uniform, improving milled rice quality by increasing head rice recovery and removing foreign matter merely depends on the performance of the milling process. Nevertheless, milling recovery and head rice recovery of typical Laotian millers are as low as 60–63% and 30.5–31.5%, respectively. Moreover, Laotian millers are seldom equipped with graders to separate head rice and broken grains, so uniformity of grain is not assured.

### E. Structure

The MAF has already set targets for increasing paddy production. However, the budget is not yet assured to implement the policy; therefore, effort must be made to allocate budget for irrigation agriculture development.<sup>112</sup> In particular, the Department of Irrigation tries to realize the irrigation agriculture development projects by use of Official Development Assistance (ODA). Table 7-4 shows two high-priority projects: the Nam Ngum Right Bank Irrigated Agriculture Project with 19,000 ha in the Vientiane capital, and the Nam Ngum Left Bank Irrigated Agriculture Project with 6,000 ha in Vientiane province.

The Department of Agriculture, MAF, distributes paddy seeds of improved Jasmine varieties of Hom Savanh and Hom Santhong at seed multiplication centers to farmers through current mechanisms of seed distribution. Technical instruction for rice cultivation is provided through either technical service centers or extension officers. There is not much difference in the cultivation methods for non-glutinous and glutinous rice; therefore, today's rice production technology and extension mechanism of the MAF sufficiently support farmers' production activities. However, non-glutinous rice should not be contaminated by mixture with glutinous rice, so some countermeasures to avoid glutinous rice being mixed in with non-glutinous rice are required. For example, rooting up the

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<sup>111</sup> According to the Department of Irrigation, MAF (October 17, 2011), more than 1 billion U.S. dollars is required to expand irrigation development areas by 150,000 ha, from 200,000 ha to 350,000 ha. This estimated cost includes agricultural inputs for cultivation, agricultural mechanization, and post-harvest facilities.

<sup>112</sup> The Department of Irrigation, MAF expects the budget to come from the following sources: ODA 10%, foreign direct investment 60%, government bonds 20%, and government's own budget 10%.

**Table 7-4 Examples of Irrigation Agriculture Development Projects**

Project	Nam Ngum Right Bank Irrigated Agriculture Project	Nam Ngum Left Bank Irrigated Agriculture Project
Period	5 years	3 years
Irrigation area	19,000 ha	6000 ha
Cropping	Double cropping	Double cropping
Production target	100,000 tons for export and 50,000 tons for domestic	20,000 tons for export and 10,000 tons for domestic
Irrigation facility	Houay Xoua and Nam Cheng dam construction Irrigation canal construction, etc.	Nam Mang gravity irrigation and Tanpio pump rehabilitation Lining of main and secondary irrigation canal, etc.
Estimated cost	150 million U.S. dollars	25 million U.S. dollars

Source: Created by the study team on the basis of project profiles of irrigation agriculture projects

glutinous paddy before harvesting the non-glutinous paddy and removing glutinous paddy left inside threshers before threshing non-glutinous paddy are some means in which the farmers should be instructed.

Paddy collectors, mediators between farmers and millers, are very familiar with the situation of the producers, as they purchase paddy from them. Collectors are sometimes also farmers. Millers and collectors contact with one another for paddy transactions. Farmers living near to the millers bring their products directly to the mill.

The milling business is a private sector investment business, rather than an ODA project. Private investors procure milling machinery and other related equipment to structure milling systems. Existing millers also renew their mills. In these cases, Japanese-owned manufacturers can be suppliers of milling systems. Millers also practice contract farming with producers. Under the contract, they provide agricultural inputs and provide land preparation work using tractors, and then purchase harvested paddy from the farmers at a minimum guaranteed buying price.

Millers sell milled non-glutinous rice to traders for export to Europe, the Middle East, and neighboring countries of Southeast Asia. Non-glutinous rice, of course, is shipped to domestic markets. Improved Jasmine rice is long-grain rice, which is different from the short-grain Japonica variety, and its amylose content is higher than that of Japonica. Therefore, in general, the former is not suitable to Japanese tastes. Hence, the Japanese market is not a target for non-glutinous milled rice.

#### F. Possibility of Introducing Milling Machinery Manufactured by Japanese-Owned Firms

There are two conditions that could encourage Laotian private millers to invest in Japanese milling machinery. First, the performance of milling machinery manufactured by Japanese-owned firms is better than that of the existing milling machinery operating in the country to produce high-quality milled rice. In general, Laotian medium- and small-scale mills use a combination of a rubber roll-type husker and an Engelberg-type steel huller. Meanwhile, Japanese manufactured milling systems are basically composed of a rubber roll-type husker and a friction-type milling machine. Milling recovery of the former is 60–63% and of the latter 65%; thus, there is not much difference. However, the big difference between the two is found in head rice recovery: 30–31.5% from the former and 50–55% from the latter. Second, in terms of cost and return, it should be determined whether millers can recoup their initial investment in purchasing milling machinery. If so, millers have to know how long that recoupment will take.

The study team simulated how long it takes to recover this investment using purchasing price, sale

from the milling business, and performance data for three different milling systems: (1) the existing typical milling system, (2) a milling system manufactured by a Thai firm, and (3) a milling system manufactured by a Japanese-owned firm. Table 7-5 shows the pre-conditions for simulation and Table 7-6 shows the performance difference among the three milling systems and purchasing prices.

**Table 7-5 Pre-Conditions of Raw Material and Milled Rice**

Item	Pre-condition
Raw material (paddy)	Improved Jasmine (Hom Savanh and Hom Santhong)
Price of paddy	3,000 Kip/kg <sup>113</sup>
Price of head rice	8,000 Kip/kg <sup>114</sup>
Milling capacity	3,000 kg/h, 24,000 kg/day (3,000 kg × 8h), 600,000 kg/month (25 days)

The paddy variety is either Hom Savanh or Hom Santhong, and its farm gate price is 3,000 Kip/kg. Milled head rice can be sold at 8,000 Kip/kg. A medium-scale milling system has a work rate of 3,000 kg of paddy to mill, so it can mill 24 tons of paddy a day with eight hours of operation. The monthly capacity based on 25 days is 600 tons. Labor, infrastructure, and other additional expenses are the same for the three systems.

**Table 7-6 Comparison of Performance and Price**

Manufacturer	Thai firm A	Thai firm B	Japanese-owned firm
Origin of machinery manufactured	Thailand	Thailand	Indonesia, Thailand, and Japan
Characteristics of milling system	Pre-cleaner, husker, Engelberg huller, length grader, bucket elevators, etc.	Pre-cleaner, husker, vertical milling machine, length grader, bucket elevators, etc.	Pre-cleaner, one pass-type husker and milling combined machine, rotary shifter, length grader, bucket elevators, etc.
Purchasing price	1,000,000 baht <sup>115</sup>	5,500,000 baht at FOB Bangkok <sup>116</sup>	19,100,000 Japanese yen <sup>117</sup> at FOB Bangkok (9,600,000 JY for pre-cleaner and milling machinery—2,400,000 JY × 4 units <sup>118</sup> —and 9,500,000 JY for grading machinery <sup>119</sup> )
Purchasing price <sup>120</sup> (kip)	266,000,000	1,463,000,000	2,024,600,000
Milling recovery (%)	60–65%	60–65%	60–65%
Head rice recovery (%)	45%	45%	50%

The medium-scale milling systems from the three manufactures use almost the same components: pre-cleaner, husker, milling machine, length grader, fine broken grain separator, and elevators. The main different parts are the milling machines at the core of the system. They are (1) Engelberg huller manufactured by a Thai firm and seen in most of the medium- and small-scale mills in Laos, (2) vertical milling machine also manufactured by a Thai company, and (3) friction-type milling machine manufactured by a Japanese-owned company.

<sup>113</sup> Interview with millers in Vientiane province (October 17, 2011)

<sup>114</sup> Interview with millers in Vientiane province (October 17, 2011)

<sup>115</sup> Purchasing price at Vientiane

<sup>116</sup> Quotation from a Thai firm

<sup>117</sup> Quotation from a Japanese firm with summation by the study team

<sup>118</sup> Milling capacity of 700 kg of paddy/h × 4 units

<sup>119</sup> Cost of one unit of elevator, rotary shifter, and another elevator is 1,960,000 JY, so the cost of 4 units is 7,840,000 JY. The cost of 2 length grader units is 1,640,000 JY (820,000 JY × 2). The total cost is 9,480,000 JY.

<sup>120</sup> 1 baht = 266.171 Kip; 1 JY = 106.437 Kip as at November 17, 2011 (<http://www.oanda.com/>)

Head rice recovery depends on this difference on milling machinery. In this case, based on an interview with the Thai firm and a quotation issued by the company, head rice recovery is between 40 and 45%. According to the Japanese firm, it is between 50 and 55%. Thus, in the simulation, 45% and 50% were used: a 5% difference.

As for comparison of purchasing price, price difference was calculated (1) between Thai firm A and Japanese-owned firm C, and (2) between Thai firm B and Japanese-owned firm C. The purchasing price difference is 1,758,600,000 Kip for (1) and 561,600,000 Kip for (2).

Then, quantity of paddy and period is calculated at the moment when difference between (1) cumulative of difference of two gross margin earned from sale of milled head rice from two compared milling systems and (2) difference of purchasing price of the two milling systems becomes positive. The next equation is formulated:

$$Y - X = Z,$$

where

Y: cumulative difference of the two gross margins earned from the sale of milled head rice from the two compared milling systems

X: difference in purchasing price of the two milling systems (1,758,600,000 Kip and 561,600,000 Kip)

Z: difference between summation of difference of two gross margins (Y) and difference of purchasing price for the two milling systems (X)

Meanwhile, paddy handled per month is 600,000 kg and paddy buying price is 3,000 Kip/kg; therefore, the next calculation can be done with M (M1, M2, M3) as gross margin from the sale of milled head rice and quality head rice and S (S1, S2, S3) as sale.

$$M = S - 600,000 \times 3,000$$

$$S = 600,000 \times \text{Head rice recovery}^{121} (0.45 \text{ or } 0.50) \times 8,000$$

Simulation results are shown in Figure 7-10, Figure 7-11, Figure 7-12, and Figure 7-13. Table 7-7 and Table 7-8 show the calculation process.

Although the purchasing price of the milling system manufactured by a Japanese-owned company is more expensive than that of the two milling systems provided by Thai firms, the purchasing cost can be recovered.

Simulation shows that break-even is exceeded in the eighth month of paddy receiving or 4,800 tons of paddy milled when comparing Thai firm A to the Japanese firm. When comparing Thai firm B to the Japanese firm, the break-even point is at only the third month or 1,800 tons of paddy milled.<sup>122</sup> Therefore, Japanese-manufactured milling systems should be supplied to private millers in Laos PDR.

<sup>121</sup> Head rice recovery for M1 and M2 is 0.45 and for M3 is 0.50.

<sup>122</sup> For irrigated paddy production, the harvesting peak is between April and May, and October and November. The quantity of supplied paddy might fluctuate monthly; therefore, the eighth month and third month do not just coincide with the number of months after the milling business starts.



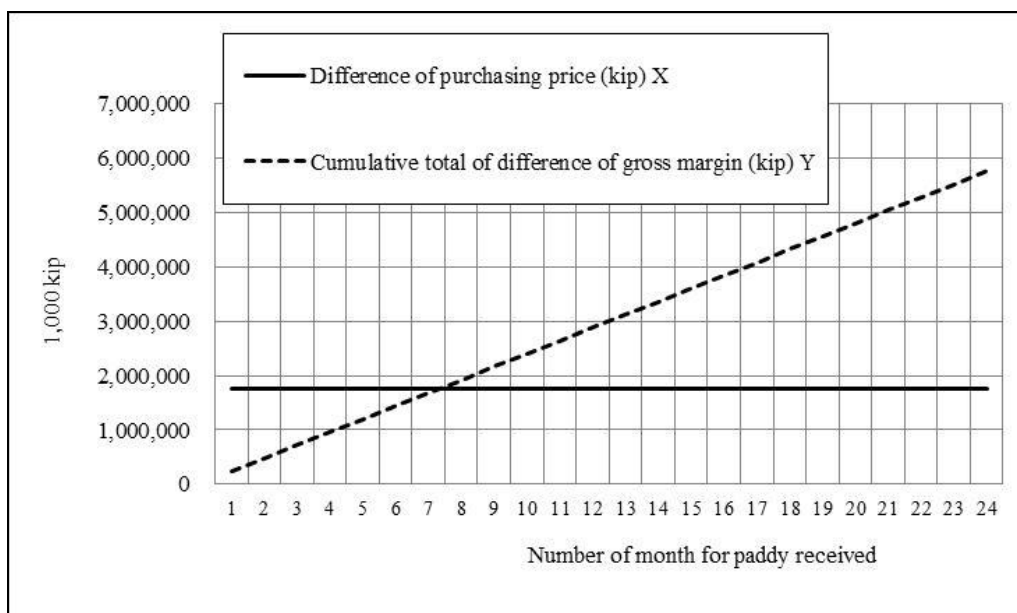


Figure 7-10 Recovery Period for Comparison between Thai Firm A and Japanese-Owned Firm C

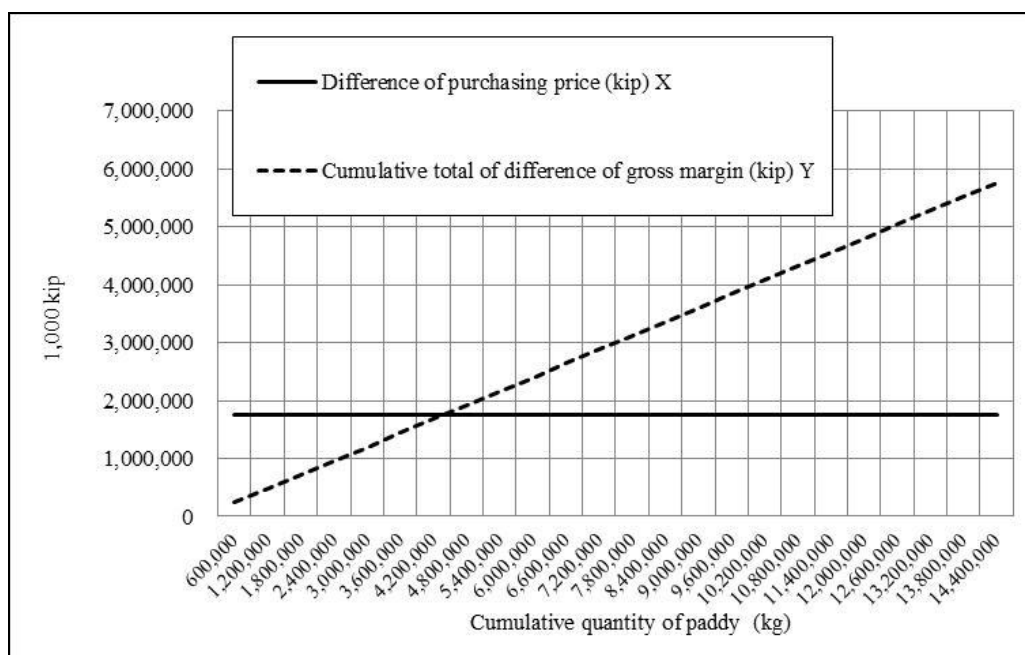


Figure 7-11 Recovery of Cumulative Quantity of Paddy for Comparison between Thai Firm A and Japanese-Owned Firm C

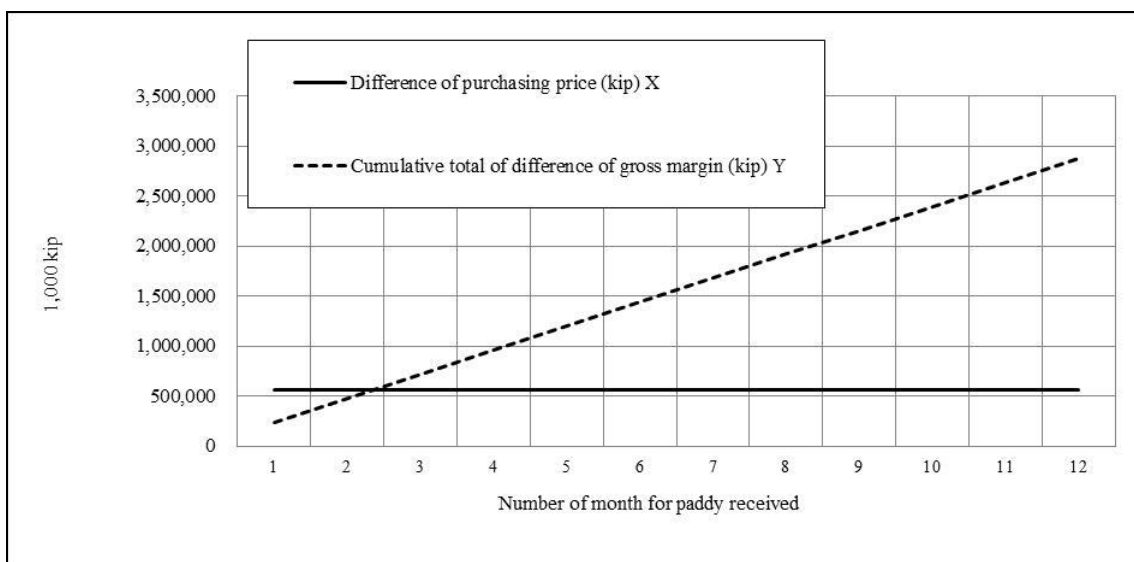


Figure 7-12 Recovery Period for Comparison between Thai Firm B and Japanese-Owned Firm C

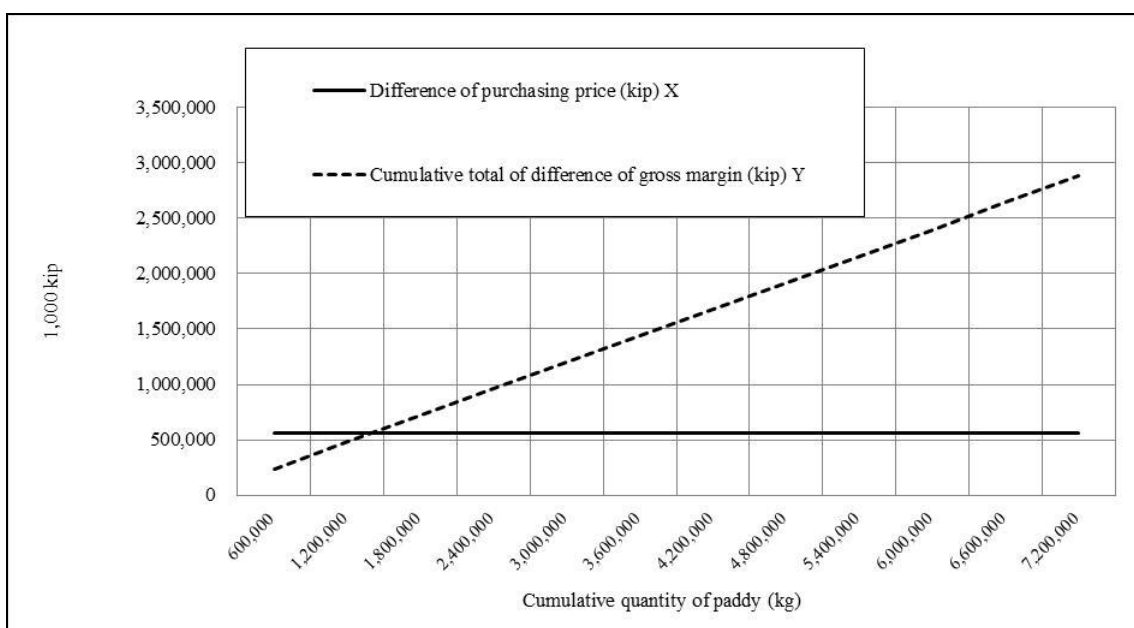


Figure 7-13 Recovery of Cumulative Quantity of Paddy for Comparison between Thai Firm A and Japanese-Owned Firm C

Table 7-7 Break-Even Point Calculation for Investing in Milling Business by Introducing Milling Machinery Supplied by Thai Firm A and Japanese-Owned Firm C

No. of months	Difference in purchasing price (kip) X	Raw material (paddy)				Sale and gross margin of quality non-glutinous rice						Cumulative difference in gross margin (kip) Y = (M3 – M1)	Difference between cumulative difference in gross margin and difference in purchasing price (kip) Z = (Y – X)
		Price (kip/kg)	Q'ty (kg)	Cost of raw material (kip)	Cumulative q'ty (kg)	Milling system of Japanese-owned firm (Head rice recovery: 50%)			Milling system of Thai firm A (Head rice recovery: 45%)				
						Q'ty of head rice (kg)	Sale of head rice (kip) S3	Gross margin of head rice (kip) M 3	Q'ty of head rice (kg)	Sale of head rice (kip) S1	Gross margin of head rice (kip) M 1		
1	1,758,600,000	3,000	600,000	1,800,000,000	600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	240,000,000	▲ 1,518,600,000
2	1,758,600,000	3,000	600,000	1,800,000,000	1,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	480,000,000	▲ 1,278,600,000
3	1,758,600,000	3,000	600,000	1,800,000,000	1,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	720,000,000	▲ 1,038,600,000
4	1,758,600,000	3,000	600,000	1,800,000,000	2,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	960,000,000	▲ 798,600,000
5	1,758,600,000	3,000	600,000	1,800,000,000	3,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,200,000,000	▲ 558,600,000
6	1,758,600,000	3,000	600,000	1,800,000,000	3,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,440,000,000	▲ 318,600,000
7	1,758,600,000	3,000	600,000	1,800,000,000	4,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,680,000,000	▲ 78,600,000
8	1,758,600,000	3,000	600,000	1,800,000,000	4,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,920,000,000	161,400,000
9	1,758,600,000	3,000	600,000	1,800,000,000	5,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,160,000,000	401,400,000
10	1,758,600,000	3,000	600,000	1,800,000,000	6,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,400,000,000	641,400,000
11	1,758,600,000	3,000	600,000	1,800,000,000	6,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,640,000,000	881,400,000
12	1,758,600,000	3,000	600,000	1,800,000,000	7,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,880,000,000	1,121,400,000
13	1,758,600,000	3,000	600,000	1,800,000,000	7,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	3,120,000,000	1,361,400,000
14	1,758,600,000	3,000	600,000	1,800,000,000	8,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	3,360,000,000	1,601,400,000
15	1,758,600,000	3,000	600,000	1,800,000,000	9,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	3,600,000,000	1,841,400,000
16	1,758,600,000	3,000	600,000	1,800,000,000	9,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	3,840,000,000	2,081,400,000
17	1,758,600,000	3,000	600,000	1,800,000,000	10,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	4,080,000,000	2,321,400,000
18	1,758,600,000	3,000	600,000	1,800,000,000	10,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	4,320,000,000	2,561,400,000
19	1,758,600,000	3,000	600,000	1,800,000,000	11,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	4,560,000,000	2,801,400,000
20	1,758,600,000	3,000	600,000	1,800,000,000	12,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	4,800,000,000	3,041,400,000
21	1,758,600,000	3,000	600,000	1,800,000,000	12,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	5,040,000,000	3,281,400,000
22	1,758,600,000	3,000	600,000	1,800,000,000	13,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	5,280,000,000	3,521,400,000
23	1,758,600,000	3,000	600,000	1,800,000,000	13,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	5,520,000,000	3,761,400,000
24	1,758,600,000	3,000	600,000	1,800,000,000	14,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	5,760,000,000	4,001,400,000

Source: The study team

Table 7-8 Break-Even Point Calculation for Investing in Milling Business by Introducing Milling Machinery Supplied from Thai Firm B and Japanese-Owned Firm C

No. of months	Difference in purchasing price (kip) X	Raw material (paddy)				Sale and gross margin of quality non-glutinous rice						Cumulative difference in gross margin (kip) Y = (M3 – M2)	Difference between cumulative difference in gross margin and difference in purchasing price (kip) Z = (Y – X)
		Price (kip/kg)	Q'ty (kg)	Cost of raw material (kip)	Cumulative q'ty (kg)	Milling system of Japanese-owned firm (Head rice recovery: 50%)			Milling system of Thai firm B (Head rice recovery: 45%)				
						Q'ty of head rice (kg)	Sale of head rice (kip) S3	Gross margin of head rice (kip) M 3	Q'ty of head rice (kg)	Sale of head rice (kip) S3	Gross margin of head rice (kip) M 3		
1	561,600,000	3,000	600,000	1,800,000,000	600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	240,000,000	▲ 321,600,000
2	561,600,000	3,000	600,000	1,800,000,000	1,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	480,000,000	▲ 81,600,000
3	561,600,000	3,000	600,000	1,800,000,000	1,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	720,000,000	158,400,000
4	561,600,000	3,000	600,000	1,800,000,000	2,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	960,000,000	398,400,000
5	561,600,000	3,000	600,000	1,800,000,000	3,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,200,000,000	638,400,000
6	561,600,000	3,000	600,000	1,800,000,000	3,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,440,000,000	878,400,000
7	561,600,000	3,000	600,000	1,800,000,000	4,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,680,000,000	1,118,400,000
8	561,600,000	3,000	600,000	1,800,000,000	4,800,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	1,920,000,000	1,358,400,000
9	561,600,000	3,000	600,000	1,800,000,000	5,400,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,160,000,000	1,598,400,000
10	561,600,000	3,000	600,000	1,800,000,000	6,000,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,400,000,000	1,838,400,000
11	561,600,000	3,000	600,000	1,800,000,000	6,600,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,640,000,000	2,078,400,000
12	561,600,000	3,000	600,000	1,800,000,000	7,200,000	300,000	2,400,000,000	600,000,000	270,000	2,160,000,000	360,000,000	2,880,000,000	2,318,400,000

Source: The study team.

### G. Pre-Condition for Japanese Companies to Participate in Projects

To promote the selling of milling machinery manufactured by a Japanese-owned firm, production of non-glutinous rice must be substantially increased in the country.

### H. Pre-Condition for Implementation of Public Sector Policy

According to the Department of Irrigation, MAF, the budget of irrigation agriculture comes from the following sources: ODA 10%, foreign direct investment 60%, government bonds 20%, and government's own budget 10%. Hence, irrigation agriculture development requires ODA from donor countries including Japan.

#### 7.3.3 Risk and External Assumption

Risks for paddy production are flood or drought attributed to climate change. As for investment in the milling business, tariffs for machinery and facilities to produce commodities for export are not incurred. Therefore, investment will be high if import tax is introduced for the machinery.

### 7.4 Candidate Project-Cluster 4: High-Quality Sesame Promotion in Northern Laos

In the northern region of Laos, farmers are forced to cultivate only a few kinds of crops due to the existence of a hilly landscape with limited flat areas. Luang Prabang province, one of the mountainous provinces, is the largest sesame production region in Laos and has several local traders/processors. However, the sesame currently produced there is meant mainly for oil extraction in neighboring countries and is not among the high-quality varieties directly consumed as food in developed countries such as Japan. The global demand for sesame, including that of the Japanese market, is robust. An experienced Japanese sesame buyer, for example, has indicated a strong interest in the potential of Lao sesame, saying that as soon as high-quality sesame is produced in Laos, he would make a purchase.

Based on the above information, a candidate project cluster, “High-Quality Sesame Promotion in Northern Laos” was proposed. This cluster includes (1) ODA Project: High-Quality Sesame Production Support Project in Northern Region, (2) Private Project 2: Purchase of High-Quality Sesame by Local Traders, and (3) Private Project 2: Purchase of High-Quality Sesame by Japanese Companies. As a result of the project cluster, Luang Prabang province has become a major center for the production of high-quality sesame in Asia, and the sesame that is produced meets the strong demand from both the Japanese and global markets. This has led to an improvement in the lifestyles of small-scale farmers living in the mountainous areas in Northern Laos.

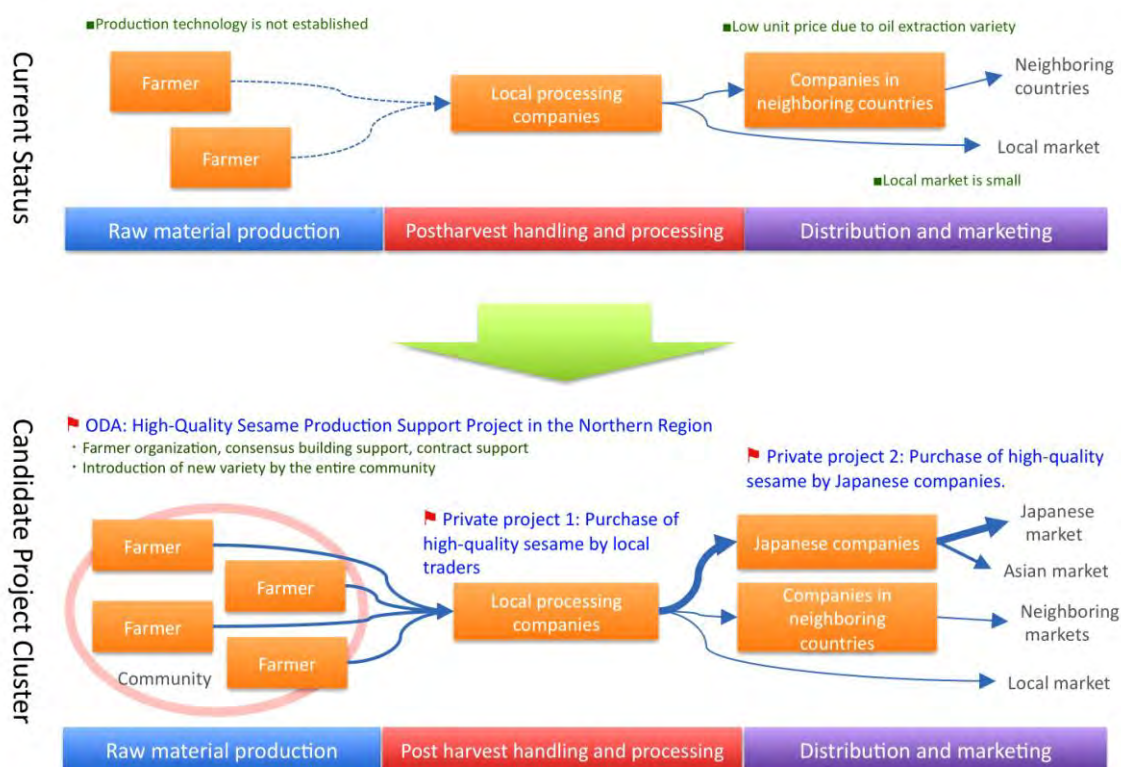


Figure 7-14 Overview of Candidate Project-Cluster 4: High-Quality Sesame Promotion in Northern Laos

### 7.4.1 Background

#### A. Luang Prabang is the Largest Sesame-Producing Province in Laos

As the hilly northern region, which includes Luang Prabang province, has limited flat areas, farmers plant upland rice in steep-sided hills for survival and earn a small cash income from a few kinds of crops, livestock, and non-timber forest products. Sesame is cultivated and the seeds are sold in the local market and exported to Thailand and China as well. In addition, sesame can grow and is harvested in smaller spaces than other cereals such as maize. Sesame is, therefore, suitable for cultivation in the northern mountainous region where flat land areas are limited. Because the bulk and weight of sesame seeds are also smaller as compared other seeds, sesame is suitable for small farmers who have limited means of transportation.

The sesame seeds currently produced in Luang Prabang are small and white in color; they are nicknamed “flea sesame” by Japanese sesame experts because of their small size. The local people consume them directly as food while Thai and Chinese buyers extract oil from them. Luang Prabang province produces more than 5000 tons of sesame seeds and ranks as the top production region of all the provinces in Laos.

#### B. Availability of a High-Capacity Sesame Grading Machine

In Luang Prabang, there are five sesame traders/processors that grade purchased sesame seeds and sell them. One of the traders has a high-capacity grading plant, which can process ten tons in an 8-hour period. As the current production amount is limited, the operating rate of the machine is still low. When high-quality sesame seeds are produced in high volumes, this machine will be better utilized.

#### C. Strong Global Demand for Sesame

The global demand for sesame is robust, primarily because China, one of largest sesame exporters in the past, became the biggest importer from 2005 onwards as a result of the rapid increase in domestic consumption based on its economic growth. According to sesame traders in Japan, this trend, led by newly developing countries such as China, will continue.

#### D. Japanese Demand for High-Quality Sesame

Japan is an importer of sesame from many countries, but in terms of black sesame, Myanmar has the overwhelming share. Sesame buyers in Japan would like to diversify its black sesame supply base to minimize the risk of climatic and political change in Myanmar. Laos has similar conditions to those found in Myanmar and is hence being considered as an alternative sesame producer.

### 7.4.2 Plan of Candidate Project-Cluster

#### A. Mission

Small farmers in the mountainous regions of Northern Laos master sesame production technology and the stable production of high-quality sesame. The high-quality sesame seeds that are produced are processed by local traders and exported to high demand markets such as Japan. As a result, there is an improvement in the living standards of small farmers in mountainous areas, who do not have substantial alternative income sources. The production target—to be achieved by 2,200 farm households by the end of the ODA project—is 220 tons, and 1,000 tons within a couple of years after the ODA project.

## B. Target Area

The target areas are the sesame production areas in Luang Prabang province. Candidates for the model community are (1) 10 communities in Kumban Donengeune in Ngoy district, (2) 7 communities in Kumban Sen Kha Ror in Luang Prabang district, and (3) 15 communities in Kumban Meuangkhay in Luang Prabang district.

## C. Outline

The ODA project is a 4-year technical cooperation project. The project promotes high-quality sesame that can be marketed in developed countries including Japan instead of the current varieties with low marketability. Working with their counterpart in the Provincial and District Agriculture and Forestry Office, the project disseminates growth management technologies to farmers. If the project seeks to distribute high-quality black sesame, which is genetically vulnerable, not just a gradual, individual change but a community-based change in certain areas as a whole becomes necessary. Thus, organizing farmers and consensus building among farmers become the key factors for the successful introduction and smooth transfer to new varieties of sesame. The project staff is in charge of organizing farmers and training while sesame growth management is taught by a short-term specialist from Asian countries such as Japan or Myanmar. Through the ODA project, highly marketable sesame seeds are produced in a stable fashion by farmers, collected and graded by local traders/processors, and purchased by Japanese companies.

Once farmers begin to produce high-quality sesame on a large scale, (1) Japanese companies and local sesame traders and (2) local sesame traders and farmers prepare contracts between themselves, witnessed by the Provincial or District Agriculture and Forestry Office. In the contract between local traders and farmers, traders are obliged to purchase produced sesame seeds. The marketing risk is taken not by farmers but by local traders in this contract. As the local traders are operating in Luang Prabang, it is difficult for them to default on a contract. At the same time, local traders and Japanese companies make contracts in which Japanese companies are obliged to purchase sesame seeds. The final marketing risk is taken by Japanese companies. They have sufficient power to fulfill the contracts.

There are five sesame traders in Luang Prabang. Of these, the trader who has a sesame grading plant should be a part of the project. The other four traders, who are licensed by area by the provincial government, should also be involved in the project regardless of whether they own/intend to own a grading machine, or they should ask the trader with the machine for custom grading.

As a local trader/processor can implement post-harvest processing with a grading machine, Japanese companies are not expected to invest in post-harvest processing facilities. Thus, the project does not need to concern itself with the minimum amount of production. A Japanese company can purchase 18 tons of sesame in a 20 feet container. However, this is about the experimental stage. An experienced sesame buyer who is interested in the sesame seeds of Laos was of the opinion that the amount of high-quality sesame seeds produced should be more than 1,000 tons for Lao sesame to make its presence felt. The project, therefore, set a production target of 1,000 tons, to be achieved within five to six years. The current sesame production in Luang Prabang is 5,000 to 6,000 tons. It thus seems possible to produce 1,000 tons of high-quality sesame seeds in Luang Prabang.

## D. Points to Consider

A technical point to consider in this project is that if the project would like to introduce high-quality black varieties, mixed cropping of white sesame and black sesame should be avoided, because black sesame is genetically vulnerable and highly influenced by white sesame. When black sesame is grown together with white sesame, now produced in Luang Prabang province, the black sesame seeds become partially gray, and marketability goes down sharply. White sesame is also similarly



influenced by the black variety. Thus, when the project introduces a new black variety, at least within the target area, only the black sesame should be planted on the basis of a consensus among farmers in the area. The entire community, not just individual farmers, needs to take a concrete decision to change from local varieties to the new black variety. Thus, consensus building in the community plays a significant role. The project supports this process of community consensus building.

In fact, not only black sesame but also new white varieties may bring about a natural crossing with indigenous ones gradually. Dominant genes could influence recessive varieties. Thus, when any new varieties are introduced, the farmers' understanding of cross-fertilization mechanisms and a consensus among farmers on the switching of varieties in a certain area are critical.

Although the new varieties to be introduced are not determined in this proposal, the candidate project cluster and its component projects are described on the assumption that black sesame will be introduced because black sesame seeds for food use have high market potential and a Japanese company has already expressed a strong interest in purchasing the black variety.

#### E. Pre-Conditions for the Involvement of Japan-Related Companies

Japan-related companies purchase the sesame seeds that are produced and processed. Providing a market is the key function of these companies and they do not invest directly in production or processing. They do not take risks involved with production and post-harvest processing.

Japan-related companies, however, provide information on the seeds of specific varieties of sesame that they would like to purchase. Seed procurement costs are covered by the ODA project for the duration of the project. Whether seeds are granted to or purchased by farmers is determined at the beginning of the project, after considering the socioeconomic environment and from the point of view of ownership enhancement.

#### F. Price Information

According to interviews with local traders, the farm gate price of sesame currently produced is 10,000 Kip/kg, the collectors' margin is 1,000 Kip/kg, and that of the processor is 850 Kip/kg. As the transportation cost of a 40 feet container, which can accommodate 36 tons of sesame, from Luang Prabang to Bangkok, including customs charges and transshipment fees is USD 3,255 and the shipping cost from Bangkok to Yokohama is USD 1,030, the total transportation cost per kg is USD 0.12. Thus, 11,850 Kip plus USD 0.12 equals USD 1.48, which is the starting price in Japan (insurance cost is not included).

Japanese sesame purchasing companies buy grade 1 sesame seeds at USD 1.8–2.2/kg (CIF price). Lao sesame seeds, therefore, seem to have a strong competitive edge. The price of lower grade sesame and sesame meant for oil extraction are USD 1.5–1.9/kg, and USD 1.0–1.4/kg, respectively. If the Lao people produce high-quality sesame, they can earn more profits than they do from the current variety for oil extraction.

### 7.4.3 ODA Project: High-Quality Sesame Production Support Project in Northern Region

#### A. Scheme

Technical Cooperation Project

#### B. Target Area

Sesame production areas in Luang Prabang province

#### C. Implementation System

Laos: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office,  
District Agriculture and Forestry Office

Japan: Experts in farmer organization, extension, training, and sesame production

## D. Project Design Matrix (PDM)

Project title: High-Quality Sesame Production Support Project in Northern Region

Duration: 4 years

Target areas: Luang Prabang province

Target group: Existing and new sesame growers

Implementation agencies: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office, District Agriculture and Forestry Office

Narrative Summary	Important assumptions	
<p>Overall goal More than 1,000 tons of high-quality sesame seeds are produced in Luang Prabang for export.</p>		
<p>Project purpose Farmers can produce high-quality sesame seeds for export not just individually but as a community.</p>		
<p>Outputs</p> <ol style="list-style-type: none"> <li>1. High-quality sesame seeds are produced on an experimental basis in the target area.</li> <li>2. Most farm households in the three first generation communities agree to switch sesame varieties.</li> <li>3. High-quality sesame seeds are produced in the three first generation communities.</li> <li>4. High-quality sesame seeds are produced in the seven second generation communities.</li> <li>5. High-quality sesame seeds are produced in the 22 third generation communities.</li> </ol>		
<p>Activities</p> <ol style="list-style-type: none"> <li>1-1. To determine trial sites</li> <li>1-2. To select 10 core farmers and train them in sesame production technologies</li> <li>1-3. Core farmers produce sesame</li> <li>1-4. To monitor the sesame production by core farmers</li> <li>2-1. To select 3 communities and organize sesame producers</li> <li>2-2. To take farmers in groups to the core farmers' field for an explanation of the contract</li> <li>2-3. To confirm their intention to switch sesame variety by group and to help them prepare contracts with local traders</li> <li>2-4. To support local traders in preparing contracts with Japanese companies</li> <li>3-1. To train farmers in groups on sesame production technologies</li> <li>3-2. Farmers plant new sesame varieties in groups.</li> <li>3-3. To monitor farmers by group</li> <li>3-4. To select mentor farmers as instructors for other communities in the following year</li> <li>4-1. To select 7 communities and organize sesame farmers into groups</li> <li>4-2. To take farmers in groups to the mentor farmer's field for an explanation of the contract</li> <li>4-3. To confirm their intention to switch sesame variety on a group basis and to help them prepare contracts with local traders</li> <li>4-4. To train farmers on a group basis in sesame production technologies and have them plant new sesame varieties in groups.</li> <li>5-1. To organize sesame farmers into groups in the remaining 22 communities</li> <li>5-2. To take farmers in groups to the mentor farmer's field for an explanation of the contract</li> <li>5-3. To confirm their intention to switch sesame variety on a group basis and to help them in make contracts with local traders</li> <li>5-4. To train farmers on a group basis in sesame production technologies and have them plant new sesame varieties in groups</li> <li>5-5. To formulate an extension program after the project</li> </ol>	<p>Inputs</p> <p>Japan:</p> <ul style="list-style-type: none"> <li>• Experts in farmer organization, training, extension, and sesame production</li> <li>• Equipment such as motorbikes</li> <li>• Operational costs</li> </ul> <p>Laos:</p> <ul style="list-style-type: none"> <li>• Counterpart in the Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Office, District Agriculture and Forestry Office</li> <li>• Office and equipment</li> <li>• Recurrent costs</li> </ul>	<p>Pre-conditions</p>

- Activity 1-1. To determine trial sites
- Activity 1-2. To select 10 core farmers and train them in sesame production technologies
- Activity 1-3. Core farmers produce sesame
- Activity 1-4. To monitor the sesame production by core farmers

As emphasized earlier, it is necessary that new sesame varieties be introduced by the entire community to avoid natural crossing. However, it is difficult to involve the entire community in conducting the very first trial. Thus, in the first year, the project identifies a few communities whose leaders are strongly interested in the new variety and selects several trial sites where the local sesame is not grown. The trial is implemented only by the core farmers. While the project is setting up trial fields, the project's sesame production expert checks the current sesame production areas and determines sites to minimize the influence of natural crossing.

The project selects core farmers and teaches them about natural crossing of sesame. The project purchases products from the trial to use for production in the next generation.

- Activity 2-1. To select three communities and organize sesame producers
- Activity 2-2. To take farmers by group to the core farmers' field for an explanation of the contract
- Activity 2-3. To confirm their intention to switch sesame variety by group and help them to make contracts with local traders
- Activity 2-4. To support local traders in preparing contracts with Japanese companies

In the second year, the project starts the community-scale switch of sesame variety. First, the project identifies three communities. The project staff and their counterparts focus their efforts on consensus building to enable the smooth switch of sesame variety in entire communities. To promote consensus building, understanding the contract between farmers and local traders is of utmost importance. In terms of variety switch, farmers are motivated only if traders can guarantee that they will purchase their product. The project should explain the conditions in the contract such as price. The project mediates between local traders and farmers. The contracts that are made will be witnessed by the Provincial or District Agriculture and Forestry Office.

The production of sesame in the second year will not exceed 15–20 tons. Nevertheless, the project will facilitate the smooth purchase by a Japanese company based on the contract between local traders and the Japanese company.

- Activity 3-1. To train farmers in groups on sesame production technologies
- Activity 3-2. Farmers plant new sesame varieties in groups
- Activity 3-3. To monitor farmers by group
- Activity 3-4. To select mentor farmers as instructors for other communities in the following year

The project organizes farmers into groups, building consensus for the switch of sesame variety. The project produces a cultivation guide and trains farmers in groups. The project delivers seeds of the new variety and farmers plant them. The project identifies mentor farmers for other communities in the following year.

- Activity 4-1. To select seven communities and organize sesame farmers into groups
- Activity 4-2. To take farmers in groups to the mentor farmer's field for an explanation of the contract
- Activity 4-3. To confirm their intention to switch sesame variety on a group basis and to help them prepare contracts with local traders
- Activity 4-4. To train farmers on a group basis in sesame production technologies and have them plant new sesame varieties in groups

- Activity 5-1. To organize sesame farmers into groups in the remaining 22 communities
- Activity 5-2. To take farmers in groups to the mentor farmer's field for an explanation of the contract
- Activity 5-3. To confirm their intention to switch sesame variety on a group basis and to help them make contracts with local traders
- Activity 5-4. To train farmers on a group basis in sesame production technologies and have them plant new sesame varieties in groups
- Activity 5-5. To formulate an extension program after the project

The new target in the third year is seven communities with 500 households and that of the fourth year is 22 communities with 1,500 households. As the distribution of the new variety should be done by the entire community, consensus building is important. The model farmers in the first and second year should contribute to these organizing efforts because the number of DAFO extension officers is insufficient.

Suppose that the average yield is 0.5 ton/ha and production area is 0.2 ha per household, the expected production amount of the final 2,200 households is 220 tons. The ODA project terminates in the fourth year but this momentum can extend sesame production and it seems possible to produce 1,000 tons within a couple of years after the project finishes, if the production and trading of the new variety is smoothly handled up to the fourth year of the ODA project.

#### 7.4.4 Private project 1: Purchase of High-Quality Sesame by Local Traders

Luang Prabang has five sesame traders/processors that purchase sesame either directly from farmers or indirectly through middlemen. Currently, their marketing channels include exports to Thailand and China for oil extraction, but in this candidate project cluster, they buy high-quality sesame seeds from farmers for sale to Japanese companies. One of the five traders/processors is equipped with an automated grading machine that can efficiently remove impurities.

Whether they take part in the proposed project cluster on high-quality sesame seeds promotion or not depends on business conditions. We asked the trader/processor who has a grading machine about the possibility of a trading price under USD 1.6/kg (12,800 Kip), which a Japanese sesame buyer indicated as a possible purchase price for high-quality black sesame. The answer was that it is indeed possible.

#### 7.4.5 Private project 2: Purchase of High-Quality Sesame by Japanese Companies

The demand for high-quality sesame seeds is very strong among Japanese companies. Although their major market is Japan, they have already begun targeting the Chinese market for high-quality sesame seeds.

#### 7.4.6 Detailed Information on Target Area

##### A. Local Traders and Processors

As stated earlier, there are five sesame traders/processors that are licensed by the local government. They trade not only in sesame seeds but also in other cereals including maize for animal feed. These traders purchase sesame seeds from farmers and grade them for sale. When they obtain a license, specific areas are allocated to them as demarcated collection zones to avoid conflict among the traders. The five traders have their offices and stock/processing facilities in Luang Prabang district and Pak Ou district.

According to the Provincial Agriculture and Forestry Office, two of these companies are more powerful than the others. One of them, Agriculture Development Promotion Imp-Exp Co. Ltd was

established in 1999. The company has 34 working members. It hires additional 50 workers in peak periods. Maize and sesame seeds are their two major items, of which sesame seeds contribute 40–50% to total sales. They sell 1,000–2,500 tons of white sesame seeds for oil extraction to three Chinese companies and two Thai companies. They also trade small quantities of black sesame—500 kg per year—in the local market. They do not have automated grading machines but instead use vacuum cleaners to blow dust and impurities. They said that if they start trading a certain minimum amount of the new high-quality sesame, they would buy automated grading machines.

The other major trader/processor is the Agricultural Fruitage Development Import and Export Co. Ltd., which has 20 working members. According to the company’s managing director, their policy is to operate with a minimum number of workers, using mechanization as much as possible. They have a sesame grading plant. Gravity screening (twice), measuring, and packing are automated (See photo in 6.4.3). They sell mainly white sesame seeds for oil extraction to China and Thailand.

Both companies did not have information on high-quality sesame seeds and their potential market. However, when we asked them whether they planned to sell sesame seeds to Japanese companies, they answered that they would be interested if the price was attractive. The managing director of Agricultural Fruitage Development Import and Export Co. Ltd. said that it is certainly possible if the selling price to Japanese companies is USD 1.6/kg.

## 7.5 Candidate Project-Cluster 5: Development of Tea Industry in Mountainous Areas in Northern Laos

Suitable areas for tea cultivation have become more widespread in the northern parts of Laos, some provinces even promote the tea industry; however, tea cultivation and industry in the north has not succeeded yet owing to the following three challenges: poor cultivation technique, low-quality processing of tea, and weak marketing. Japanese beverage manufacturers are looking for tea leaves that can be used to develop new products, and Japanese trading companies have needs for cheap tea leaves that are to be blended with other tea leaves.

Taking into account the aforementioned background, the JICA survey team proposes the candidate project-cluster for “the Development of Tea Industry in Mountainous Areas in Northern Laos”. The cluster consists of (1) ODA Project: Project to Support Tea Cultivation, Processing, and Marketing in Mountainous Areas in Northern Laos, (2) Private Project 1: Strengthening of Processing and Marketing by Local Processing Companies, and (3) Private Project 2: Advising of Processing Methods and Purchase of Laotian Tea by Japanese Companies. This cluster is intended to not only produce high-quality fresh leaves but also to process the fresh leaves into tea leaves that match Japanese needs, and then to have the leaves supplied to the Japanese market by a Japan-based company. The cluster will help realize the development of the tea industry in northern Laos, improve the living standards of small farmers in mountainous areas, and contribute to new beverage product development and a stable supply of tea leaves to Japan.

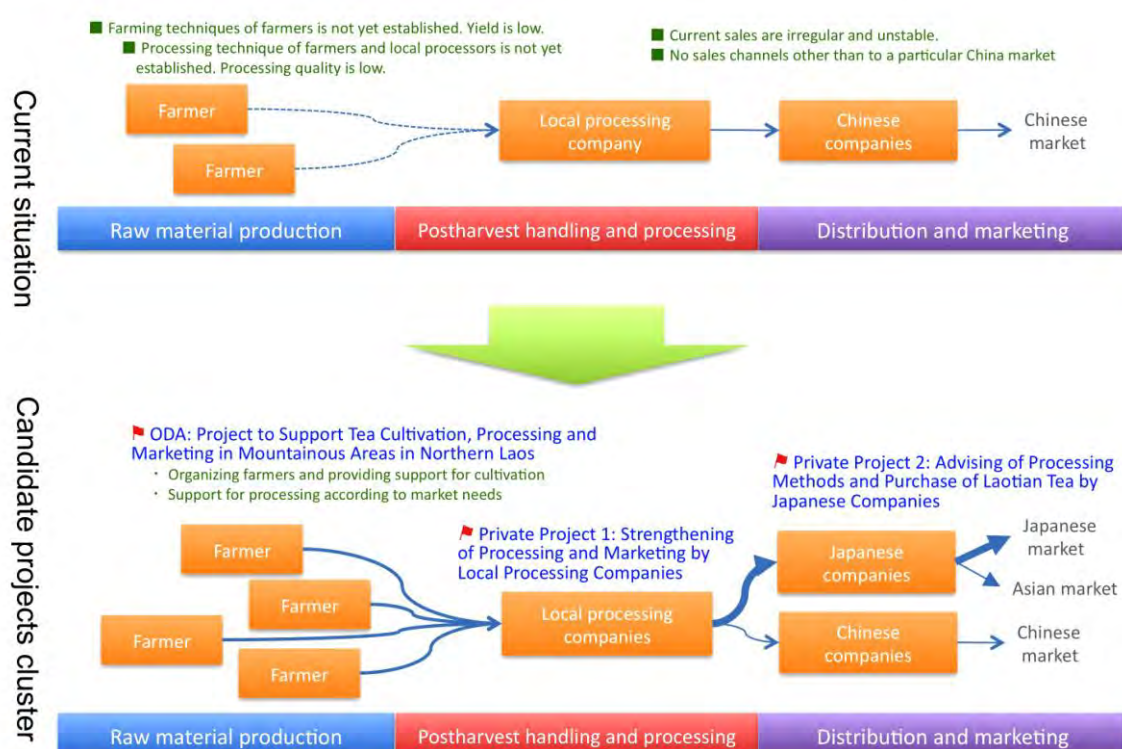


Figure 7-15 Overview of Candidate Project-Cluster 5: Development of Tea Industry in Mountainous Areas in Northern Laos

### 7.5.1 Background

#### A. The High Potential of the Tea Industry in Three Provinces in Northern Laos

Northern Laos has such incredibly suitable lands for tea cultivation that even wild tea trees grow there (Box 6.5). Oudomxay, Luang Prabang, and Phongsaly provinces have around 3,000 ha (hectares) of tea farms and there are another 16,000 ha of available lands for tea cultivation. The provinces also have tea processing industries that are in operation and have a processing capacity of 500 tons annually on the basis of processing tea leaves. Because 500 tons of processed tea leaves can produce 100 million bottles of tea drinks, it can be said that the current capacity has a considerable presence in the market.

Considering the vast available cultivation areas and the considerable processing capacity, authorities, processing companies, and farmers, are together starting the development of a tea industry in the north that can generate income for small farmers and develop the mountainous areas.

#### B. Challenges Confronting Three Provinces in Northern Laos

The tea industry in the three provinces cannot realize its great potential, because of the following three challenges. The first challenge is that their current techniques for tea cultivation are limited. There are very little technical human resources or accumulated know-how on tea cultivation available in the area. Tea farmers cultivate their plants with not-established techniques, and, as a result, the yield is low and tea tree diseases are spreading. The second challenge is that the marketing abilities of processing companies are limited. Processing companies do not survey markets or buyers, and they do not plan for sales activities. Thus far, they have dealt with particular Chinese companies, so that they have limited sales channels and do not grasp other markets, other buyers, or new business opportunities. The third challenge is that the level of technology of the processing companies is limited. Processing companies are able to perform a significant capacity of processing tea leaves; however, their processing technology and quality have room for improvement. This is because, thus far, they have produced only tea leaves that are roughly processed, raw materials for Puer tea, and that are required by the particular Chinese companies. The limited marketing activities have hampered the processing companies from accumulating experience in developing processing methods according to market needs.

The three challenges interact with each other. For example, as processing companies do not perform marketing activities, they cannot catch business opportunities and, as a result, do not make efforts to refine their processing methods. Therefore, their sales channels remain weak, and the purchasing price of fresh leaves from farmers is kept at a low level. Farmers are uncertain that tea leaves will continue to be purchased at a stable price; therefore, they hesitate to invest more inputs in tea farming.

#### C. Japanese Companies Looking for Tea Leaves

Japanese companies are looking for tea leaves. Beverage companies want tea leaves as material for new tea beverage products. New products are actively released to the Japanese market, and beverage companies put high priority on the development of new products. Laotian tea leaves are likely to attract Japanese beverage companies, because they are grown in undeveloped mountainous areas in a natural environment, and because they are grown by farmers leading traditional lives. In fact, it was evaluated whether or not to include a processing storyline for the new products. As for their processing techniques, Japanese companies do not care about the current low level, because they have enough experience in developing processing methods with local partners. On the other hand, Japanese trading companies search for cheap tea leaves, and are only expected to purchase Laos tea leaves if the price is attractive.



Considering A. to C. below, the JICA survey team proposes an ODA Project of strengthening cultivation and marketing, and Private Project 1, wherein local processing companies refine processing methods and technology in cooperation with Japanese companies. There is also Private Project 2 wherein Japanese companies support local processing companies in developing tea leaves, and match the market needs, and purchase the leaves.

### 7.5.2 Plan of Candidate Project-Cluster

#### A. Mission

The mission of the project-cluster is to improve the living standard of small farmers, contribute to Japanese companies' development of new tea beverage products, and develop a stable supply of tea leaves for the Japanese market by increasing the fresh tea leaf production of small farmers, by processing fresh leaves into a product that matches the market needs of Japan, and by exporting the leaves to Japan. The numerical target is to have 4,500 ha of tea cultivation; 500 ha, 400 ha, and 3,600 ha of which are in Oudomxay province, Luang Prabang province, and Phongsaly province, respectively, and also to have 2,000 tons of processed tea leaves and 4 million dollars of sales by 2020.

#### B. Target Area

Oudomxay province, Luang Prabang province, and Phongsaly province. Details of the target areas are explained in Annex 2.

#### C. Outline

At the beginning of the cluster, the ODA Project first starts and implements support for cultivation techniques and marketing.

As for the support for better cultivation techniques, the project will mobilize technical resources from Japan, Taiwan, China, etc., and identify cultivation techniques suitable for the target areas. The project is to organize tea farmers and train the organized farmers through extension workers.

As for the marketing support, the project is to be an intermediate between local processing companies and Japanese buyers, such as trading companies, of tea leaves. The project's purpose is to grasp the current processing technology and capacity of local processing companies. At the same time, the project must find potential buyers and understand their needs. Thereafter, the project is to attempt to intermediate local processing companies and potential buyers by matching them up. Specifically, the project is to introduce tea leaves that are processed by locals to buyers in order to obtain the buyers' evaluation of the leaves, their demand, and the trading condition on the leaves. They should then provide feedback to local processors by making recommendations. Another goal of the project is to take sample leaves to buyers, which are processed according to buyers' needs, as a trial. When necessary, the project is to support sending tea leaves to exhibitions. The above activities are to be repeated so that local processing companies will recognize business opportunities and take initiatives to upgrade their processing quality and strengthen their capacity, which is precisely the beginning of Private Project 1. Then, as Laotian tea leaves considerably improve and are able to match the quality needed by Japanese companies, the Japanese companies will have more interest in Laotian tea and begin direct contact with local Laotian processing companies. The marketing support in the ODA project will end when local processing companies begin to take account of the markets and buyers and when Japanese companies begin to directly communicate with the local processing companies.

The next step after the ODA project is Private Project 1. Stimulated by the marketing support by the ODA project, local processing companies will launch Private Project 1. In other words, based on

information of market and business opportunities provided by the ODA project, the companies will invest in equipment, human resources, and research and development in order to strengthen their capacity and technology to produce tea leaves, which satisfy market needs.

Private Project 2 is to be launched by Japanese companies, and will likewise be stimulated by the ODA project. In other words, the Japanese companies will give assistance to local processing companies in their development of tea leaves, which match the Japanese market's needs and will purchase the tea leaves.

This is not a case in which either Private Project 1 or Private Project 2 will advance ahead of the other. They will advance farther by working in sync. In other words, if Private Project 1 goes further, Private Project 2 will also proceed further as a result of the advancement of Private Project 1.

All three of the projects should improve implementation, marketing activities and processing quality, which will enhance the sales power of local processing companies. Then, the companies will increase demand for fresh tea leaves, which, in turn, will enhance the farmers' motivation for tea cultivation. Then, utilizing cultivation techniques taught by the ODA project, farmers will improve yield and expand tea farms, which increases the amount of production and the quality of fresh leaves. As a result, local processing companies will be able to produce more tea leaves, and Japanese companies can purchase more tea leaves.

The following are specific directions, whereas the above descriptions are considered overall directions:

#### Schedule

- Both the components of the ODA project, support of cultivation, and support of marketing, are to be implemented at the same time from the beginning. Tea cultivation techniques should be introduced as early as possible, because diseases have already occurred and tea farms are planned to be expanded. Marketing should also be started as early as possible, because the tea business in the target areas will be forced to stop if it cannot secure sales channels. Particularly, new farms will be ready to be harvested from 2012 on and, therefore, more fresh tea leaves will be produced. This implies that processing companies need to secure larger amount of sales than in 2011, otherwise processing companies will not purchase all of the produced fresh leaves, which will discourage farmers.

#### Cultivation

- Cultivation techniques introduced in the ODA project should be selected in accordance with areas, because some areas have already started tea cultivation and other areas are going to start it later on.

#### Marketing

- Not particular buyers, but, instead, various sources should be assumed as potential buyers at the beginning. Many different buyers should be contacted.
- Not only big buyers, but also small buyers should be targeted in the marketing practices. Laotian tea is not known in Japan at all. There is little possibility that deals with big buyers and beverage companies will be made at the beginning. Therefore, the marketing component should approach small buyers, such as special tea shops and fare-trade companies as well as attempt to approach big buyers. Approaching small buyers is intended to gain know-how and recognition in Japan by accumulating many small deals. However, it should be kept in mind that even lots of small deals cannot generate enough sales to absorb all of the production that will occur in the target areas. Therefore, marketing to small buyers should be treated as a temporary activity to accomplish big deals with larger buyers. The small buyer marketing should be limited to a certain scale and duration.
- The marketing should target not only Japanese buyers but also buyers in other countries. This is

because it is necessary to sell Laotian tea before deals with Japanese companies are made. Otherwise, the Laotian tea industry will be stacked.

- Special care will be necessary when the ODA project approaches buyers and collects information on buyers' needs and trade conditions, because this is related to buyers' secret business strategies. For example, if the project explains general information on Laotian tea to buyers, the project can extract general reactions and information about needs from buyers. However, if the project approaches them as an agent of Laotian processing companies, the project can evoke seriously concerned reactions from buyers. If the project leaks information, then the project will lose its relationship with their buyers.

### Local Processing Companies

- As of November 2011, a local company was considering whether to start a processing business in Luang Prabang province. Therefore, the project-cluster should be launched in Luang Prabang province after the processing business of the company is confirmed to be started. Oudomxay and Phongsaly provinces do not need the same care, because processing companies currently exist and already operate processing businesses in the province.

## D. Price Information

### (1) Cultivation

The profit of cultivation that is practiced in Oudomxay province is as follows.

Inputs are only seedlings. Fertilizer is not used. One seedling costs between 500–1,000 Kip and the density of the planted seedlings is 20,800 per hectare (40 cm × 120 cm). Therefore, the total input per hectare is going to be 10.4–20.8 million Kip. The total cost is not inclusive of the cost for land preparation and labor.

Yield per seedling without application of fertilizer is 0.14 kg in the fourth year and 0.19 kg in the fifth year on a fresh leaf basis. Converted into a per hectare basis, the yield is 2.912 tons/ha in the fourth year and 3.952 tons/ha in the fifth year. Since the current average price of fresh leaves is 2,500–4,500 Kip/kg, the revenue will be 7.28–13.1 million Kip/ha in the fourth year and 9.88–17.74 million Kip/ha in the fifth year.

From the above calculation, it is obvious that tea cultivation will bring farmers enough profit, although the cost above does not include labor cost.

### (2) Processing

Profit from the operation of a small processing machine is introduced here.

A small processing machine whose capacity is 400 kg/day on a fresh leaf basis costs 17.75 million Kip. The price of fresh leaves is 3,000–5,000 Kip/kg on an average.<sup>123</sup> 4 kg of fresh leaves yield 1 kg of processed leaves. The price of processed leaves is 20,000 Kip/kg.<sup>124</sup> In a case where a processing machine uses its full capacity, 400 kg of fresh leaves, which cost 1.2–2 million Kip, are processed daily into 100 kg of processed leaves which will generate 2 million Kip of revenue. The daily gross profit is 0–0.8 million Kip. The annual gross profit is 80 million Kip, if it is assumed that operation of processing is held for 200 days per year, and the annual average price of fresh leaves is 4,000 Kip/kg. The operation of processing is considered to need only a little expenditure, such as fuel and labor cost. It can be concluded that tea processing is profitable.

<sup>123</sup> Inclusive of transportation cost, 500 Kip/kg

<sup>124</sup> The price for which a processing company in Oudomxay province purchases processed tea from farmers is applied as the price of processed tea.

## E. Pre-Condition for the Japanese Company to Launch Projects

A precondition for the Japanese company to purchase Laotian tea is traceability. Japanese companies are likely to be so concerned about traceability and the safety quality control of Laotian tea that they do not give serious thought to purchasing this tea. Therefore, the ODA project and local processing companies should make traceability and safety publicly proven in order to relieve Japanese companies' concerns, and to encourage them to start business with Lao tea processors.

It should be noted that both, the minimum value of a deal with a Japanese company and the minimum unit price for the deal, would depend on different cases. If Lao tea is traded as a raw material for a new tea beverage product, then the unit price of tea leaves is not an important issue, whereas 100 tons of tea leaves per year are necessary as a minimum. If Lao tea is traded as a substitute for cheap leaves that are usually blended with other kinds of leaves, then the price is one of the most important points, whereas the minimum amount of leaves would be just 20 tons annually.

### 7.5.3 ODA Project: Project to Support Tea Cultivation, Processing, and Marketing in Mountainous Areas in Northern Laos

#### A. Scheme

Technical assistance

#### B. Target Area

Oudomxay, Luang Prabang, and Phongsaly provinces

#### C. Implementation System

Laos: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Offices (PAFO), District Agriculture and Forestry Office (DAFO), National Agriculture and Forestry Research Institute (NAFRI), Ministry of Industry and Commerce (MOIC), Provincial Industry and Commerce Office

Japan: Experts on cultivation techniques, organizing farmers/extension, marketing/value-chain design, traceability/quality control, and export support

The components of tea cultivation concerning the establishment of cultivation techniques, organization of farmers, and technique extension to farmers will be implemented by the MOAF. As for the identification of appropriate cultivation techniques and the development of textbooks on the techniques, NAFRI is to take the initiative and accumulate techniques on tea cultivation. At present, NAFRI does not have any unit or personnel in-charge of tea cultivation; therefore, it will be necessary to, at first, establish a unit or assign a staff member responsible for tea cultivation at NAFRI. As there is no technical resource existing in Laos, a short-term expert on the technique is to be deployed several times from foreign countries, such as Japan, Taiwan, Vietnam, and China. Training on cultivation techniques for farmers is to be conducted by the extension staff members of DAFO under the overall control of DAFO and PAFO. The component of marketing is to be implemented by the MOIC line. Activities in foreign countries, such as Japan, are to be conducted by experts on the Japan side. Advisory tasks for Laotian processing companies are to be performed by MOIC and experts from the Japan side in cooperation with Provincial Chamber of Commerce. Activities on traceability and quality control are to be conducted by both the MOAF and the MOIC. Activities to facilitate the exportation procedure are to be conducted by the MOIC.

## D. Project Design Matrix (PDM)

Project title: Project to Support Tea Cultivation, Processing, and Marketing in the Mountainous Areas in Northern Laos

Project duration: Five years

Target areas: Oudomxay, Luang Prabang, and Phongsaly provinces

Target group: Tea farmers and tea processing companies

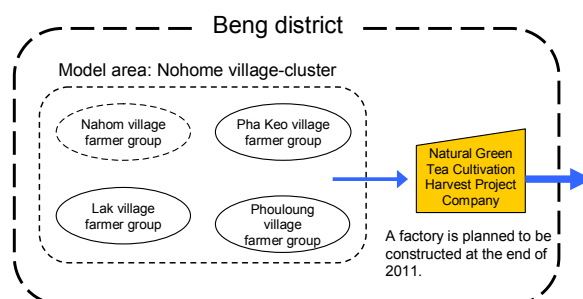
Implementing organizations: Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Offices, District Agriculture and Forestry Office, Ministry of Industry and Commerce, and Provincial Industry and Commerce Office

Narrative summary		Assumptions
<p>Overall goal</p> <ol style="list-style-type: none"> <li>1. Yield, cultivation area, and the number of tea farmers will be increased. Avoid the spread of disease.</li> <li>2. Sales power, channels, and volume of local processing companies are increased.</li> </ol>		
<p>Project purposes</p> <ol style="list-style-type: none"> <li>1. Yield, cultivation area, and the number of tea farmers are increased. Avoid the spread of disease.</li> <li>2. Sales power, channels, and volume of local processing companies are all increased.</li> </ol>		
<p>Project outputs</p> <ol style="list-style-type: none"> <li>1-1. Appropriate cultivation techniques are established.</li> <li>1-2. Farmers' cultivation techniques are improved.</li> <li>1-3. An office and persons in charge of accumulating cultivation techniques are established, and the techniques are accumulated.</li> <li>2-1. Potential buyers and their needs are identified and further understood.</li> <li>2-2. Quality and conditions of Laotian tea leaves that are required for sales from a market point of view are clarified.</li> <li>2-3. Local processing companies understand information, challenges, and the potential that is clarified in Activities 2-1 and 2-2.</li> <li>2-4. Potential buyers have better knowledge and understanding on Laotian tea leaves.</li> <li>3-1. Traceability and safety are secured.</li> <li>3-2. There is a system to convince any concerned person about the secure traceability and safety.</li> <li>4-1. Relevant persons and organizations are capable of smoothly completing the procedure for export.</li> </ol>		<ul style="list-style-type: none"> <li>- Private Project 1 is launched. Local processing companies make activities to improve quality, increase capacity, develop products, and invest in equipment.</li> <li>- Private Project 2 is launched. Japanese companies conduct technical assistance to local processing companies and purchase Lao tea.</li> </ul>
<p>Activities</p> <ol style="list-style-type: none"> <li>1-1. Determine model areas of tea cultivation.</li> <li>1-2. Specify appropriate cultivation techniques. Specify appropriate techniques for intercropping.</li> <li>1-3. Develop textbook on tea cultivation and intercropping.</li> <li>1-4. Conduct TOT for extension workers.</li> <li>1-5. Organize tea farmers.</li> <li>1-6. Train farmers on cultivation in model areas through training courses, follow-up activities, etc.</li> <li>1-7. Refine techniques on tea cultivation and intercropping, and create textbooks on the basis of the results of activities in model areas.</li> <li>1-8. Expand project activities such as the organization of farmers and the technique extension to other areas than only the model areas, if necessary.</li> <li>1-9. Support necessary activities to establish a system of accumulating know-how and lessons on cultivation based on project activities not only in the project but also in the Laotian government.</li> <li>2-1. Clarify products and the capacity of local processing companies.</li> <li>2-2. Clarify types, quality, and conditions of tea leaves required by potential buyers in Japan, Laos, China, Europe, and so forth.</li> <li>2-3. Introduce tea leaves produced in the target areas to potential buyers, and confirm their reactions and evaluation, and then clarify conditions for deals.</li> <li>2-4. Feedback information from Activity 2-2 and 2-3 on the requirements and conditions for deals with local processing companies.</li> <li>2-5. Advise local processing companies about processing methods and the development of projects from the market's viewpoint.</li> <li>2-6. Give advice on the cultivation from the market's viewpoint, if necessary.</li> <li>2-7. Repeat Activities 2-3, 2-4, 2-5, and 2-6 in case local processing companies improve the quality of tea leaves or develop new kinds of tea leaves.</li> <li>2-8. Send Lao tea leaves to exhibitions, if necessary.</li> <li>3-1. Support for securing and proving traceability and safety.</li> <li>4-1. Support the procedure for exportation in case deals with overseas buyers are made.</li> </ol>	<p>Inputs</p> <p>Japanese side</p> <ul style="list-style-type: none"> <li>- Experts (cultivation technique, organizing farmers/extension, marketing/value-chain design, traceability/quality control, export support)</li> <li>- Equipment (motorbikes, processing machines)</li> <li>- Expenditure for project activities</li> </ul> <p>Laotian side</p> <ul style="list-style-type: none"> <li>- Counterparts (MOAF, PAFO, DAFO, NAFRI, MOIC, Provincial Industry and Commerce Office)</li> <li>- Building and facilities</li> <li>- Local cost for the project</li> </ul>	<p>Pre-conditions</p> <ul style="list-style-type: none"> <li>- A unit in charge of tea cultivation on the Laotian side is established.</li> </ul>

Activity 1-1. Determine Model Areas of Tea Cultivation

Considering the situation of tea cultivation, spare areas to expand coffee farms, locations of processing factories, priorities of local authorities, the ODA project determines model areas for tea cultivation. Based on the information collected in the JICA survey, the following areas are considered to be candidate model areas.

Candidate areas in Oudomxay province are the four villages: Nahom, Phouloung, Lak, and Pha Keo, which are all in the Nahome village-cluster of Beng district. In these areas, the local processing company, Natural Green Tea Cultivation Harvest Project Company and local authorities have jointly started a tea project.



In the tea project, currently 576 households cultivate tea in 230 ha of farms in total. The project plans to expand tea farms to 500 ha and expand the number of households to 1,300 in five to six years. The local processing company, Natural Green Tea Cultivation Harvest Project Company, plans to construct a processing factory in Beng district and come to the four villages. When the JICA survey team visited the candidate areas in November 2011, the team confirmed that tea farmers were organized and that the initiatives of leading farmers were quite high. The team found farms that were well managed, which indicates the existence of well-experienced farmers. For example, a farmer who graduated from a vocational college and is a primary school teacher intercroops tea, rubber, and bloom grass well. There are other five or six persons who received the same level of education. If such experienced farmers are centered when the ODA project organizes farmers, the ODA project can effectively and efficiently conduct extension activities.



Figure 7-16 Districts in Oudomxay Province



Figure 7-17 Beng District and Nahome Village-Cluster

The candidate model area in Luang Prabang province is 204 ha of tea farms that were developed in 2008. Tea farms in Phoukhoun district are located intensively along Routes 7 and 13. Two small processing machines are planned to be equipped either solely in Phouvieng Noy village or in the villages of Phouvieng Noy and Lak 5. Therefore, villages along Routes 7 and 13 are the best candidate areas. In particular, Lak 5 village and Somboun village have high potential, because there are at least two farmers in Lak 5 village who process fresh tea leaves and are vigorously trying to

expand sales to areas outside Luang Prabang province. Because Somboun village has been active in the past in terms of agriculture, its processes and ability to sell fresh leaves by farmers is advanced, and it has approximately 10 well-experienced farmers.

Xianggeun district in Luang Prabang province also has tea farms. In this district, the Kiew Kajum village-cluster is considered to have high potential as a tea cultivation area. However, the district is to be excluded from the target areas of the ODA project, because no processing factory is operated or planned.

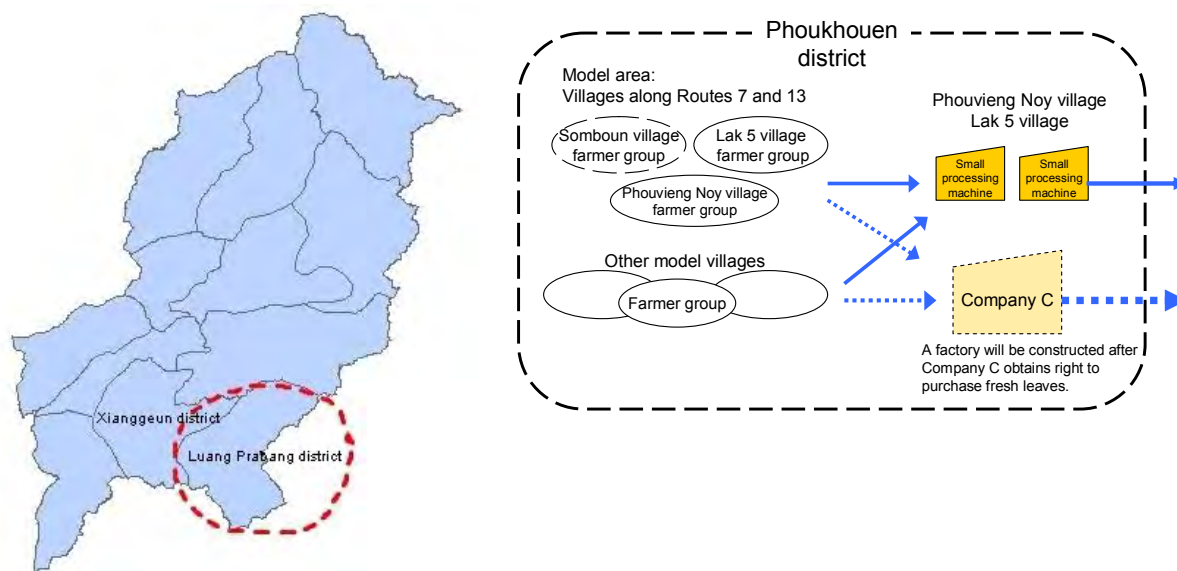
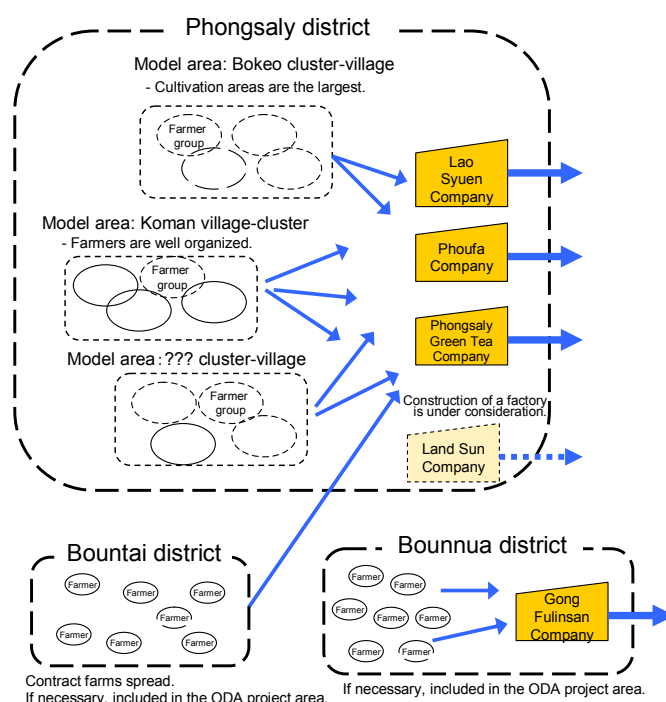


Figure 7-18 Districts in Luang Prabang Province

In Phongsaly province, Phongsaly district is considered to be a high-priority candidate model area, because the district has the largest total area of tea farms, that is, 1,362 ha. The district also has the biggest capacity of tea processing, because the Lao Syuen Company, Phoufa Company, and Phongsaly Green Tea Company all operate processing factories and even the Land Sun Company is considering the establishment of a processing factory. High-potential cultivation sites in terms of size of existing tea farms in the district are Phokeo village-cluster, Lak 18 village-cluster, and Phoufa village-cluster, which have tea farms sized 472 ha, 372 ha, and 307 ha, respectively. Koman village-cluster has 199 ha of tea farms, but can be included as a model area, because tea farmers in Koman village in the village-cluster are well organized and actively cultivate tea. Apart from Phongsaly district, Bountai district can be included as a model area, because Phongsaly Green Tea Company has contract-farming farms in the district; Bounnua district can be included, because Gong Fulinsan Company has a processing factory in the district; Gnot Ou district can be included, because Gnot Ou Company plans to construct a processing factory if the company will really purchase fresh leaves from farmers.



Figure 7-19 Districts in Phongsaly Province



Activity 1-2. Specify appropriate cultivation techniques. Specify appropriate techniques of intercropping

Activity 1-3. Develop a textbook on tea cultivation and intercropping

Since there is no expert on tea in Laos, the project will mobilize an expert from foreign countries for identifying a tea cultivation technique appropriate for the target areas. Just as the intercropping of pineapple, galangal, broom grass, rubber, etc. is practiced, appropriate intercropping techniques will also be identified. After identifying techniques, the techniques are to be refined on the basis of results of activities in the model areas. The project should develop textbooks on established techniques.

Activity 1-4. Conduct TOT for extension workers

Activity 1-5. Organize tea farmers

Activity 1-6. Train farmers on cultivation in model areas by training courses, follow-up activities, etc.

The ODA project is to transfer the cultivation technique specified in Activity 1-3 to extension workers by TOT (Activity 1-4). Extension workers are to visit model areas and organize tea farmers (Activity 1-5). Thereafter, the extension workers train organized farmers on cultivation in model areas by training courses, monitoring, and follow-up activities (Activity 1-6).

Staff members of DAFOs will work as extension workers within the project. The numbers of staff members of DAFO in charge of the extension are presented in Table 7-9. Although the number of staff in charge of the extension on the agricultural sector is small, staff members can work on tea cultivation irrespective of responsible sectors according to DAFO.

Table 7-9 The Number of Staff Members in Charge of Extension at District Agriculture Forestry Offices in Phongsaly Province

	Phongsaly district	Beng district	Phoukhoun district
No. in total	About 25	About 40	17
Agriculture	(unknown)	(unknown)	2
Livestock	(unknown)	(unknown)	10
Forestry	(unknown)	(unknown)	4
Irrigation	(unknown)	(unknown)	1

Source: Interviews with the PAFO of Phongsaly province, District office of Beng district, DAFO of Phoukhoun district



When the project organizes farmers, the project should pay considerable attention to the selection of key farmers in order to transfer cultivation techniques on to other farmers through those key ones.

In the case that farmers need to process fresh leaves on their own, the ODA project will support the processing as well as the cultivation. As processed tea leaves are to be purchased and sold to markets by local processing companies, the project has to conduct the support of farmers' processing jointly with the processing companies. Examples of cases that support the processing that is required are (1) a processing company encourages farmers to process fresh leaves, and (2) fresh leaves cannot be transported to a processing factory when rain is so heavy that traffic access is cut. The ODA project should subsidize the purchase of small processing machines that cover a few villages, if necessary.

#### **Activity 1-7. Refine techniques on tea cultivation and intercropping, and create textbooks on the basis of the results of activities in model areas**

Based on results of farmers' practice of cultivation technique taught in Activity 1-6, the project is to refine this technique. If necessary, the project is to revise textbooks.

#### **Activity 1-8. Expand project activities such as organization of farmers and technique extension to other areas than the model areas, if necessary**

Considering the results, experiences, and know-how obtained from activities in model areas, the project is to expand areas to support, if necessary.

#### **Activity 1-9. Support necessary activities to establish a system to accumulate know-how and lessons on cultivation from project activities not only within the project, but in Laotian government**

A significant amount of experience and know-how regarding tea cultivation is expected to be gained from Activity 1-1 thru Activity 1-8. The experiences and know-how should not be held in the project but be accumulated institutionally and sustainably in Laotian government and be shared by various relevant persons. This will help with the expansion of tea cultivation in areas other than the target areas of the ODA project. Since, at present, the Laotian government has an institution or unit in charge of tea, the ODA project is to support the Laotian government in establishing a unit in charge of tea that intensively accumulates tea growing and processing techniques. NAFRI has conducted activities on tea on a small scale with the support of donors, and a Laotian who is not a permanent staff member, but instead a contracted staff who has worked on tea vigorously. There may be a way for this current system to be strengthened and a unit in-charge of tea at NAFRI to be set up.

#### **Activity 2-1. Clarify products and capacity of local processing companies**

It is necessary for the ODA project to clarify products and the capacity of local processing companies initially when the project introduces Lao tea leaves to potential buyers and relevant persons, and subsequently when it asks about the possibility of business with Laotian tea. When the project introduces local processing companies and promotes their products to buyers in Activity 2-2 and after, the project may obtain only a general reaction from buyers and attract little concern from buyers if the project explains general matters about local processing companies and their products. Therefore, the project has to have enough information to be like an agent of the local processing companies.

It is necessary for the project to provide local processing companies with enough explanation about the activities and objectives of the project in order to encourage companies to initiate effort on the improvement of processing quality and capacity according to feedback from marketing. A company that does not accept the project or express initiative should be considered for exclusion from the project. Appendix 2 describes existing local processing companies in the target areas of the project.

Activity 2-2. Clarify the kind, quality, and conditions of the tea leaves required by potential buyers in Japan, Laos, China, Europe, etc.

Activity 2-3. Introduce tea leaves produced in the target areas to potential buyers, and confirm their reactions and evaluation and clarify conditions for deals

The project will contact potential buyers in the tea markets of various countries, such as Japan, Laos, China, Taiwan, Europe, and the USA in order to clarify the kind, quality, and conditions on tea leaves that are required (Activity 2-2). Furthermore, the project will give tea leaves as samples to buyers in order to obtain their reactions and evaluation, and to clarify what will be necessary for future deals (Activity 2-3). Not particular buyers, but several various buyers should be assumed for their potential, especially at the beginning. Not only big buyers but also small buyers should be targeted in marketing. It is certain that small buyers are not going to be enough to sell all the tea leaves of the target areas, because the potential in the target areas is very high. Therefore, the project should be planned to attain bid deals with big buyers. Japanese buyers that the project is expected to contact are beverage companies, general trading companies, tea-specialized trading companies, tea shops, and packers. Activities 2-2 and 2-3 are implemented mainly by experts from the Japanese side, because the activities are conducted in foreign countries.

Special care on information collected from relevant organizations, especially private companies, will be necessary. Most useful information is likely to be confidential. If the project does not commit to the confidentiality, then the only information to be obtained from companies will be merely general, common, and not useful. The project should carefully manage information and feedback it to local processing companies in order to build relationship with buyers. For example, organizations and persons to which the project provides feedback information to are limited to a local processing company providing sample tea leaves and some particular counterparts.

Activity 2-4. Feedback information from Activity 2-2 and 2-3 on the requirements and conditions for deals with local processing companies

Activity 2-5. Advise local processing companies about processing methods and development of projects from the market's viewpoint

The project will share results of Activity 2-3 with local processing companies and help them to understand what improvement is necessary from market's perspective (Activity 2-4). When local processing companies start to improve the processing quality or develop products based on the results of Activities 2-3 and 2-4, then the project is to advise them from market's viewpoint (Activity 2-5).

Activity 2-6. Give advice on cultivation from the market's viewpoint, if necessary

If Activities 2-2 and 2-3 make it clear that improvement on cultivation such as improving the quality of fresh leaves is necessary, then the project is to share this necessity with MOAF and experts, and to support the improvement from the market's viewpoint.

Activity 2-7. Repeat Activities 2-3, 2-4, 2-5, and 2-6 in case local processing companies improve quality of tea leaves or develop new kinds of tea leaves

When local processing companies improve the quality of tea leaves or develop new products of tea leaves based on Activities 2-4 and 2-5, the project is to introduce the tea leaves to buyers like in Activities 2-2 and 2-3, and should acquire feedback on the results for companies like in Activity 2-4.

Activity 2-8. Send Lao tea leaves to exhibitions, if necessary

Considering necessary expenses, the project will send tea leaves to both domestic and overseas exhibitions, if necessary.

### Activity 3-1. Support for securing and proving traceability and safety

Foreign companies, particularly Japanese companies, are likely to worry about traceability and quality control of Laotian tea leaves, because the leaves are not known in foreign countries. The purchase of the leaves by foreign companies will not be realized unless the traceability and quality control are secured. Therefore, the project is to input an expert on traceability and quality control, to clarify what is necessary to improve them, and to assist in the improvement.

Therefore, the ODA project and local processing companies should make traceability and safety secure and proven in order to relieve Japanese companies, and to encourage them to start business with Lao tea companies.

By the way, both the minimum amount of a deal with a Japanese company and the minimum unit price for the deal would depend on circumstances. If Lao tea is traded as a raw material for a new tea beverage product, then the unit price of tea leaves is not an important issue, whereas 100 tons of tea leaves per year are necessary at minimum. If Lao tea is traded as a substitute for cheap leaves that are usually blended with other kinds of leaves, then price is one of the most important points, whereas the minimum amount of leaves would just be 20 tons annually.

### Activity 4-1. Support procedure for exportation in a case that deals with overseas buyers are made

The project is supposed to support the procedure for exportation to foreign countries, such as Japan, in case Lao tea is exported. The JICA survey team met several food industry companies who are worried about a complicated procedure, and who are not interested in exporting to Japan because of the complicated procedure. This fact indicates that Laotian companies need support if they need to export their products to Japan. Therefore, the support for Laotian processing companies to export tea leaves, especially to Japan, is to be provided in the ODA project.

#### 7.5.4 Private Project 1: Strengthening of Processing and Marketing by Local Processing Companies

In Private Project 1, local processing companies allot inputs for the improvement of processing quality, strengthening of processing capacity, and human resource development to produce tea leaves satisfying the needs of Japanese buyers. When Private Project 2 is launched by Japanese companies, local processing companies must develop tea leaves jointly with the Japanese companies.

Local processing companies have depended on particular Chinese companies that deal mainly Puer tea. Since the local processors have produced roughly processed tea leaves, raw materials for Puer tea, they do not know about markets or buyers other than the Puer tea markets and buyers. However, local processors want to expand their sales channels. If they are convinced of what kinds of tea leaves are demanded by which market, then they are willing to produce the tea leaves by developing their processing technique and capacity. In fact, responding to the growing demand for red tea, some processors have recently started to produce abundant amounts of red tea in 2011.

#### 7.5.5 Private Project 2: Advising of Processing Methods and Purchase of Laotian Tea by Japanese Companies

In Private Project 2, Japanese companies give local processing companies advice on processing methods and purchase the tea leaves.

Japanese beverage companies are looking for tea leaves that can be utilized to create new products. In the project, they will sometimes visit Laos and develop tea leaves that suit new products with local processing companies.

Japanese trading companies are searching for good but cheap tea leaves that can substitute leaves that are currently used. The unit price of leaves should be around 2–3 dollars/kg. At present, roughly processed tea leaves are exported to China at the price of 20 Yuan, equivalent to about 3.13 dollars, which is a higher than acceptable price of substitute tea leaves. However, there may be a possibility that the price is reduced to 2–3 dollars, because the price of raw material, that is, fresh leaves, for 1 kg of processed tea leaves is 12,000 Kip, equivalent to 1.5 dollars. Japanese trading companies are able to purchase a considerable amount, 20 tons for example, of processed tea leaves and can guarantee consistent purchases, which will enable Laotian processing companies to accept the reduction in price.

## Appendix 1 Detailed Information on Target Areas of Candidate Project-Cluster 1: Development of Coffee Growing in Sekong Province

### A. Socioeconomic Situation in Dakchung District

Dakchung district is located in a mountainous area where traffic accessibility is poor and the living standard of the people is low. The district is one of the 47 poorest districts in Laos. Slash-and-burn cultivation has traditionally been practiced in the district. The current main means of livelihood are cultivation of rice, cassava, coffee, vegetables, and livestock. The poor accessibility makes it difficult for people to sell cash crops and attain self-sufficiency. However, in Siang Louang village-cluster, which the JICA survey team visited, farmers cultivate and gain cash income from coffee. The farmers have a strong interest in and high expectations of coffee cultivation because of the recent high price of coffee in the global market and the positive attitude of processing companies toward strengthening processing capacity.

### B. Policy of Local Authorities

Sekong provincial authority wants to promote coffee cultivation as a new source of cash income. The authority recognizes that farmers have developed an increasing interest in the cultivation and recommends it as a measure to break away from poverty and slash-and-burn cultivation. Moreover, the authority plans to include promotion of coffee cultivation in Dakchung district in its next five-year plan.

More specifically, the authority wants to expand the coffee cultivation area and improve cultivation techniques. As there are areas where bauxite, iron, copper, gold, and coal lie underground, the authority emphasizes that a land-utilization plan needs to be formulated and land for coffee cultivation allotted to farmers. The authority considers the cultivation techniques that are currently in use inadequate and assumes that quality and quantity can be greatly improved. Therefore, the authority is keen to organize farmers and provide them technical support.

Public support for coffee cultivation that has been provided thus far includes free seedling distribution through PAFO in Sekong province and DAFO in Dakchung district, as well as technical training by SAFREC and DAFO. However, the scale of support has been too small to realize a significant effect. For example, the number of free seedlings distributed in 2011 was 3000, which is sufficient for covering only approximately 1 ha. The provincial Planning and Investment Department recognizes that budget and capacity for promotion of coffee cultivation are lacking locally and that external support is needed.

### C. Current Situation of Coffee Growing in Dakchung District

Before scrutinizing the target area of the project-cluster, Dakchung district, this paragraph briefly reviews coffee cultivation across the entire Sekong province (Table A1-1). Thateng district is the largest coffee cultivation area in the province. The cultivation area in Thateng district is 6,769 ha, far larger than that in Dakchung district (769 ha). Thateng district includes a portion of Bolaven Plateau and is easily accessible; therefore, coffee cultivation in the district has been practiced. However, most land suitable for coffee cultivation is already developed and available land is now scarce. In contrast, Dakchung district has plentiful available land; on the other hand, Lamam and Kalum districts have little area suitable coffee cultivation.

**Table A1-1 Coffee Cultivation Area in Sekong Province**

District	Population*	Cultivated area in 2010 (ha)**
Dakchung	20,675	769
Thateng	34,861	6,769
Lamam	30,970	156
Kalum	14,858	8
Total	101,364	7,702

Source: \*DPI of Sekong province \*\*PAFO of Sekong province

The situation in Dakchung district is assessed below. According to Dakchung district authority, coffee cultivating areas in the district account for 1,097 ha (Table A1-2). The DPI of Sekong province indicates that there is as much as 15,000–20,000 ha of undeveloped land suitable for coffee in the district. Moreover, 20% of the 1,097 ha of currently cultivated land grows Catimor and 80% grows Robusta. Cultivation began near the border with Vietnam, in Dakmoung village-cluster, under Vietnamese support. Subsequently, the Laotian government supported the expansion of coffee cultivation in other areas, such as Siang Luang village-cluster. In particular, yield and Arabica coffee's cultivated areas increased from 2007 to 2009.

While more than 30 villages in Dakchung district grow coffee, 6 villages in Siang Louang village-cluster are unusually active in coffee cultivation. Cultivation in these six villages serves to influence farmers in other villages to consider coffee cultivation.

Coffee harvested in Siang Louang village-cluster is sold in cherry form to middlemen, who come irregularly. The middlemen sell the cherry to the biggest local processing company, Dao Huang Group.

In addition to coffee cultivation by farmers themselves, cultivation by private companies is beginning to expand. At least three companies have been given land concessions and begun coffee cultivation. A trunk road crossing the district, Route 16, should be finished by around 2015, after which accessibility will be improved and more private investors are expected to do business in the district. In fact, PAFO said that it received more external inquiries and visits in 2011 than usual.

#### D. Traffic Accessibility in Dakchung District

Motor vehicle access in Dakchung district in the rainy season is difficult even by a motorbike. The bad accessibility isolates the district and makes selling produce difficult. As a result, farmers cultivate crops for self-consumption and lead subsistence lives. Undoubtedly, bad accessibility is the main reason for the high poverty rate in the district.

Currently, Route 16, crossing from east to west and into Vietnam, is being constructed; as mentioned above, it will improve accessibility tremendously by around 2015. It is expected that more middlemen will come to the district; that the purchasing price of coffee cherries will be higher because of reduced transportation costs; and that extension of cultivation techniques will become easier. Therefore, now is a good time to begin promotion of coffee cultivation in the district.

#### E. Coffee Processing Companies

There is no coffee processing in Sekong province. Coffee harvested in Dakchung district is processed in Champasack province.

Processing companies that conduct operations on a significant scale are Dao Heuang Group, Outspan, Sinouk Café, Sivilay, Pelsavan, and Oudomxay Company. Dao Heuang Group is the dominant player because of three characteristics that support coffee farmers in south Laos. The other processing companies do not have these characteristics. The first characteristic is that Dao Heuang has a large capacity for processing and purchases a large amount of coffee. Its capacity for Arabica coffee is 2,000 t/day on a cherry basis, which exceeds the other companies' capacities, none of which are more

**Table A1-2 Coffee Cultivation Area in Dakchung District**

Village-cluster	Population	Cultivated area (ha)
Dakchung	5,525	420
Xieng Louang	4,728	353
Dak Taok	1,935	196
Ayoun	2,161	37
Prouap	2,421	19
Lak 20	1,543	48
Datu	1,076	12
Dukdin	1,495	12
Total	20,884	1,097

Source: Dakchung District Land Management Authority (2011)

Note: Total cultivated area in Dakchung district is different from the figure in Table. This may be due to a difference in the sources.

than 100 t/day. The company is now organizing a new unit to produce instant coffee and aggressively purchasing raw materials such as cherries and parchments. Its purchasing area spreads across four provinces in southern Laos. The second characteristic is that Dao Heuang's requirements for raw materials are not demanding. When it purchases cherries, it checks only whether the ratio of red-colored cherries, which are mature, is more than a certain amount (Box A1-1). The third characteristic is that Dao Heuang purchases raw materials irrespective of their production areas or middlemen. It does not check who bring the cherries or where they are from, and so everyone can bring and sell cherries to Dao Heuang Group. These three facts support coffee farmers because they can sell cherries without restriction. Furthermore, the third characteristic makes the system of collecting cherries very simple. Anyone can be a middleman if he has a means of transportation.

#### Box A1-1 Dao Heuang Group Cherry-Purchasing Unit

The JICA survey team visited a Dao Heuang unit that purchases coffee cherries in Paxon district in Champasack province. Although it was at 1800h and already dark, cherries were coming in constantly. Nobody knew who was bringing them and the unit staff members did not check. The cherries were assessed by glance only. Unless considerable amounts of cherries were still green, the quality was acceptable and the cherries were purchased, at the same price (by variety) irrespective of quality. Deals were made efficiently in less than a minute. Shortly after purchase, the cherries were mixed with other cherries and then sorted and processed. This unit was open until 2200h



Cherries being weighed-in. These cherries were carried on a motorbike by a female farmer. The woman riding a motorbike in the upper left is waiting for her turn.



The cherries were put into a machine to store them. Immature cherries, which were green, were included.

## Appendix 2 Detailed Information on Target Areas of Candidate Project-Cluster 5: Development of the Tea Industry in the Mountainous Areas of Northern Laos

### A. Oudomxay Province

Lands suitable for tea cultivation exist across Oudomxay province. The tea industry is fairly new in the province.

The area of land under tea cultivation is presented in Table A2-1. The province has over 5,000 ha of land suitable for cultivation. However, only 251 ha has been cultivated thus far, all of which was developed as part of a project.

#### (1) A Project on Tea Cultivation

In 2008–2009, local authorities in Nahom village-cluster in Beng district determined that the promotion of tea cultivation would help eliminate poverty and also put a stop to slash-and-burn cultivation. The project included allotment of land to farmers, provision of loans to them with a three-year suspended repayment period, and training to farmers conducted jointly by the Plant-Harvest Green Tea-Natural Tea Project Company and DAFO of Beng district. If the allotted land is not used by a farmer, the land is re-allotted to another farmer. The Plant-Harvest Green Tea-Natural Tea Project Company is responsible for purchasing and processing fresh tea leaves, and sells the processed tea leaves.

There are seven villages in Nahom village-cluster in Beng district, out of which Nahom, Phouloung, Lak, and Pha Keo villages cultivate tea. There are 40–70 households in each village. The altitude ranges from 800–1,200 m. Further, 130 ha and 100 ha of land was cultivated in 2008–2009 and 2010–2011, respectively; 50 ha will be cultivated each year until the total cultivated area reaches 500 ha. Currently, there are 576 farmers and this number is expected to grow to 1,300 toward the end of the project.

The tea trees were planted in rows measuring 40 cm × 120 cm, with the density reaching 20,800 trees/ha. On a fresh leaf basis, the yield per tree without application of fertilizer was 0.14 kg and 0.19 kg in the fourth and fifth year, respectively. On a per hectare basis, the yield reached 2.912 ton/ha and 3.952 ton/ha in the fourth year and fifth year, respectively.

Plant-Harvest Green Tea-Natural Tea Project Company secured a loan of 3 billion Kip and plans to construct a processing factory toward the end of 2011.<sup>125</sup> The capacity of a cooker is 12 ton/day on a fresh leaf basis. There are no transportation issues between the factory and farms. In addition to this factory, the company has placed a small processing machine (capacity 1 ton/day) in Pha Keo village. Contract farmers process fresh leaves using this machine. The company mainly produces green tea leaves, most of which are exported to China, and a part of which is distributed domestically. The company hires four persons and provides training for the persons about how to prepare the land and foster seedlings. Further, the company has contracted tea farms of 27 ha in Namor district.

#### (2) Livelihoods of Farmers

Farmers earn their livelihood through the cultivation of upland rice, galangal, corn, bloom grass, and livestock.

Table A2-1 Tea Cultivation in Oudomxay Province in 2011

District	Cultivated tea		Area of wild tea (ha)
	Area (ha)	No. of farmers	
Xay Namor	27	56	200
La Gna Beng	224	520	520
Pakbeng Houn			
Total	251	576	722

Source: PAFO of Oudomxay province.

<sup>125</sup> This company also runs gas stations and timber businesses.



The yield of upland rice and corn is 1 ton/ha and 3 ton/ha (un-husked corn), respectively. Rubber trees were planted a few years ago and are expected to contribute to farmer incomes in the future.

Most farmers do not produce sufficient rice for home consumption; therefore, they need cash income to buy additional rice. For example, only 30% of the households in Pha Keo village are self-sufficient in this respect. The rest earn cash income by working at the houses of richer people in and around the village, or by selling bloom grass and bamboo shoots.

### (3) The Potential and Challenges on Tea in Oudomxay Province

#### The Potential

- Availability of all necessary players: The province is home to all the necessary players needed for the tea industry: farmers, processing company, and local authority. These parties are keen to promote the tea industry.
- Well-organized farmers: There are well-organized and high-capacity farmer groups in the province. Some villages in Nahom village-cluster in Beng district have farmer groups interested in the cultivation and processing of tea. When the JICA survey team visited one of these villages, they noted high motivation levels among leading farmers. There are also five college graduates who are capable of training and mentoring the other farmers.
- Availability of land: Approximately 5,000 ha of land is suitable for tea cultivation in the province.
- Organic cultivation: Thus far, there has been no use of chemical fertilizer or other chemicals during cultivation. In other words, farmers have been practicing organic cultivation. Therefore, it would be comparatively easy to meet safety and traceability standards.
- Unique selling proposition (USP) to attract consumers: Not only cultivated tea trees but also wild tea trees are grown in vast areas of Oudomxay province. In particular, the mountains near the provincial border with Bokeo province are so abundant in wild tea trees that local people call the mountains “wild tea tree mountains.” Tea leaves cultivated and harvested in the province where rare wild tea trees naturally grow may be able to impart a storyline or product concept such as “natural tea leaves” and “original taste leaves.”

#### The Challenges

- Cultivation technique not established: Although the cultivation technique was introduced by Chinese companies, it has not yet been confirmed to be appropriate for the given circumstances.
- Lack of a technical resource on cultivation technique: There is no expert or specialized institution dedicated to tea cultivation in Laos. For example, there is no knowledge about tackling disease in tea trees.
- Scant marketing experience and limited sales channels: Thus far, the processing company has dealt with only a small number of Chinese companies. However, beginning in 2012, the amount of harvested leaves will increase. Therefore, the company will need to find other buyers.
- Farmer anxiety about tea being a new crop: Farmers are worried about whether fresh tea leaves will be purchased from 2012 onward. If the processing company will not purchase them, they are likely to switch to the production of some other crop.

### B. Luang Prabang Province

Luang Prabang province is partly similar to Oudomxay province, in that tea cultivation in Luang Prabang province was expanded through a project as in Oudomxay province. However, the similarity ends there. Unlike Oudomxay province, the project derailed in Luang Prabang province. The project was launched in 2008 with the intention to expand tea cultivation to 10,000 ha. It was successful in assisting farmers in cultivating a total of 811 ha. However, a processing company, which is one of implementers of this project, does not purchase or process the tea leaves.

### (1) A Derailed Project

In 2007, the price of Puer tea soared on account of speculative purchases. Considering the soaring price, a Laotian local company (Company A), and a Chinese company (Company B) began a project designed to produce raw materials for Puer tea. The project areas were located in Phoukhoun and Xiengyeun districts. The project obtained cooperation from local authorities and was approved by the DPI of Luang Prabang province and the Vice Prime Minister.

According to the initial plan, Companies A and B would provide seedlings to farmers, educate them on the transfer cultivation technique, construct a processing factory, purchase fresh leaves from farmers, and sell processed tea leaves to China. Farmers were not allowed to sell fresh leaves to other companies, and were required to repay expenses incurred by the companies on seedlings (500 Kip per seedling) through their income from selling leaves. Under the scope of the project, the cultivation areas under contract were to be expanded to 10,000 ha. The farmers cleared 811 ha of land and began tea cultivation.

However, the price of Puer tea fell in 2008. Thereafter, Company B absconded. Company A was unable to function without Company B, given that the latter was supposed to provide technical inputs on cultivation and processing, as well as establish sales channels. Unfortunately, Company A was unable to strike deals with new business partners, and did not have the technical resource or buyers necessary for the operation. Currently, Company A does not own any processing equipment or visit the project site. The company does not purchase leaves from the farmers.

### (2) Distressed Situation of Tea Farmers

The project areas are mountainous and unsuitable for rice cropping. Farmers rely on income from sales of pineapple, ginger, garlic, vegetable, sesame, corn, job's tears, etc. They also used to grow opium. In general, their living conditions are harsh and agriculture is practiced on a small scale. As they suffer from poverty, they had high hopes for tea cultivation.

However, without the sale of fresh leaves, farmers are undoubtedly disappointed with the current situation. Tea farms are left uncared for. Some farmers cut down the tea trees and planted other crops instead. Others began to intercrop pineapple with tea.

As seen in Table A2-2, 799 farmers began cultivation at the beginning of the project in Phoukhoun district. The cultivated area at this time was 629 ha and 160 ha in Phoukhoun district and Xiengyeun district, respectively. However, as of July 2011, only 204 ha was recognized as cultivated area in Phoukhoun district, while the other 447 ha was diverted to other crops or left uncultivated. Tea leaves from existing farms are sold to Chinese and Vietnamese companies, although they visit the project area irregularly.

**Table A2-2 Tea Cultivation in Phoukhoun District**

Village-cluster	Initial no. of farmers	Initial cultivated area (ha)	Cultivated area as of July 2011 (ha)
Chim	118	126	43
Thetsaban	245	173	26
Phouvieng	223	190	23
Phakeng	39	38	23
Phonxay	64	26	32
Phou Soong	110	76	57
Bokeo	0	0	0
<b>Total</b>	<b>799</b>	<b>629</b>	<b>204</b>

Source: DAFO and relevant persons in Phoukhoun district.

### (3) New Developments in Tea Cultivation

Some new developments have occurred in tea cultivation in Phoukhoun and Xiengyeun districts. Taking note of the serious situation, local authorities are intervening in order to revive the tea industry in these districts. A district governor has assumed the role of leader, and is working on transferring rights related to the project to another company, namely, Company C. In this scheme of

things, the District Administration Office would procure two processing units,<sup>126</sup> each with a capacity of 400 kg/day on a fresh leaf basis, and rent them to Company C. Company C would then organize farmers, teach them how to process the fresh leaves, contract them to do the same, and purchase the processed leaves. Company C plans to establish a processing factory of capacity 4–5 ton/day, provided it is granted project rights. As of October 2011, the District Administration Office had procured the units. However, the scheme has failed to move ahead on account of opposition from Company A.

In Xiengyeun district, the District Administration Office requires Chinese middlemen to train farmers on processing skills. The leaves processed by the farmers are sold to the middlemen. Recently, the cultivated area was expanded to 15 ha.

There is yet another development, this time brought about by the farmers themselves. Some farmers received training in the processing technique from Chinese middlemen, and thereafter improved upon it. The leaves processed by these farmers are shipped to the domestic market, China, and the USA.<sup>127</sup> At least two villages are reported to have such farmers.

#### (4) The Potential and Challenges on Tea in Luang Prabang Province

##### The Potential

- Rising momentum for the revival of the tea industry: The local authorities, farmers, and Company C share a common goal of reviving the tea industry.
- Farmers as leaders: In two villages at least, farmers have learnt to overcome the current situation. Such farmers in turn may serve as a source of inspiration to other farmers and bring about farmer-centered development of the tea industry.
- Vast areas suitable for tea cultivation: Approximately 10,000 ha of land has yet to be cultivated.
- Quality of fresh leaves: The fresh tea leaves harvested in Phoukhoun and Xiengyeun districts are highly valued by the Chinese and Vietnamese middlemen.
- Organic cultivation: Thus far, no agricultural chemicals or fertilizers have been used as inputs for any kind of cultivation (including tea).
- USP to attract consumers: Consumers are likely to prefer organically or naturally produced tea leaves.

##### The Challenges

- Cultivation technique not yet established: The cultivation technique of the tea leaves has not yet been established here as it has in Oudomxay province.
- Lack of a processing company: Although Company C plans to start a processing business, it cannot take action because Company A insists on holding on to its right to purchase tea leaves from farmers. Until this dispute is settled, no processing can take place in the province.
- Farmers abandoning tea tree plantations: Disappointed with the results of tea tree plantations, some farmers have cut the tea trees and planted other crops instead. If the current situation continues, more trees are likely to be cut.

#### C. Phongsaly Province

Phongsaly province is the largest producer of tea leaves in Laos. According to a local processing company, approximately 500 ton of tea leaves is processed annually. In general, the history of tea production in the rest of Laos is short, but tea has been cultivated since approximately 400 years ago in Koman village in Phongsaly district (Box in 6.5). The custom of consuming tea started in the district at least 50 years ago. However, although tea has been produced for local consumption since many years, commercial production begun only as recently as the 1970s. A chronology of tea cultivation in Phongsaly province is as shown in Table A2-3.

<sup>126</sup> One of the two machines was bought with a financial contribution from World Vision, an NGO.

<sup>127</sup> The sale of tea in the USA occurs through relatives living in the country (i.e., there is no official export channel).

Table A2-3 Chronology of Tea Cultivation in Phongsaly Province

Year	Event
1600s	Tea cultivation began in Koman village, which used to be known as Lungching village at the time.
1970	A tea association was established owing to an initiative taken by the government, and tea leaves began to be shipped to Vietnam. However, in 1988, the association became defunct because the price of tea dropped.
1995	The local government initiated a policy to promote tea cultivation in Phongsaly district or Phongsaly province. Seedlings were distributed to farmers. Commercial cultivation was started.
1998	The local government attempted to expand cultivation areas using the services of a company from Yunnan, but the expansion stopped after a period of one year.
1999	A company from Yulin in the Guangxi province of China established a processing company named Phoufa in Phongsaly district. Seedlings were distributed in 21 villages. (The Phoufa Company continues to operate even today.)
2006– 2008	The price of tea rose sharply. A processing company named Lao Syuen was established in 2006. (It continues to operate even today.) Laotian established a processing company named Phongsaly Green Tea Company. Contracted farming was expanded in Bountai and Samphan districts. In 2008, Ya Tong Company started tea farming. (It is planning construction of a processing factory in Gnotou district.) In 2008, Sukwisand Company started tea cultivation in 11 villages, but had to stop the business because price of tea dropped.
2009	Gong Fulinsan Company constructed a processing factory in Bounnua district.

Source: JICA survey team based on interviews in Phongsaly province.

## (1) Tea Cultivation in the Province

About 2,148 ha of cultivated land exists in Phongsaly province. Tea is cultivated in 153 villages (Table A2-4).<sup>128</sup> According to PAFO,<sup>129</sup> 1,590 ha of land is harvested, and there is over 1,500 ha of undeveloped land suitable for tea cultivation. PAFO hopes to increase the cultivated area to 3,600–3,900 ha by 2015.

Some farms are uncared for. The yield works out to 1.5–4.5 ton/ha on a fresh leaf basis, with an average of 2–3 ton/ha. Fertilizer is not utilized. Cultivation density is area-specific, and ranges from 38,000–49,800 tree/ha, which is very dense. The variety of tea is the same as that from China.

## (2) Livelihoods of Farmers

Many farmers rely on tea cultivation. As it is difficult to grow rice in mountainous areas, farmers buy rice using income from tea sales. According to PAFO, other than tea and small amounts of rice, rubber, sugarcane, passion fruit, black cardamom, coffee, etc. are cropped. All four farmers in the group-interview conducted by JICA survey team in a village in Phongsaly district live on cash income from tea, which has become a significant source of their income (Table A2-5).<sup>130</sup> The local government also gives high priority to tea cultivation.

<sup>128</sup> Different from the statistics compiled by MOAF.

<sup>129</sup> Another 558 ha was planted in approximately the last three years.

<sup>130</sup> One of the four farmers also operates a small shop and buys rice using the revenue from his shop.

Table A2-4 Tea Cultivated Areas in Phongsaly Province

District	Village-cluster	No. of households	Cultivated area (ha)	District	Village-cluster	No. of households	Cultivated area (ha)
Phongsaly	Hatsa	37	12	Gnotou	Nayao	315	5
	Km18	303	372		Phadeng	393	22
	Koman	423	199		Outai	608	16
	Phou Fa	891	307		Ouneua	436	21
	Phokeo	819	472		Soumkham	463	25
	Sub-total	2,473	1,362		Malithao	158	1
Samphan	Phousangmai	41	12	Bountai	Nalouang	578	9
	Phousangkao	15	3		Yot Ou	598	35
	Kongsavee	31	5		Banla	232	7
	Phongkoulouang	38	21		Sub-total	3,781	141
	Mouchikang	28	7		Numpok	283	32
	Mouchikangkao	52	17	Sumphanxai	830	39	
	Laopanlouang	25	7	Longhang	438	48	
	Lisiso	31	6	Sub-total	1,551	119	
	Nonghoum	31	8	Bounnua	Bounnuea	-	81
	Erpa	42	13		Phiengxay	-	32
	Yangpa	28	9		Banmai	-	264
	Numthouang	27	10		Ngaiynuea	-	5
	Sub-total	389	117		Sub-total	-	382
Khoa	Senlath	294	18	Mai	Sub-total	3,106	0
	Dubkajok	145	9				
	Sub-total	439	27				
Total for Phongsaly province		More than 11,739	2,148				

Source: JICA survey team based on statistics compiled by PAFO of Phongsaly province.

Note: Cultivated areas include areas where wild tea trees grow. The figures for Samphan district indicate villages, not village-clusters. There are no figures for village-clusters in Mai district because tea is not cultivated there.

Table A2-5 Living Situation of Tea Farmers in Phongsaly Province

	Tea farmer 1 (male)	Tea farmer 2 (female)	Tea farmer 3 (female)	Tea farmer 4 (female)
Composition of household	Interviewee, wife, daughter	Interviewee, husband, two children. The children are economically independent.	Interviewee, husband, children	Interviewee, husband. Three children attend school in Vientiane.
Livelihood	Tea: 40,000 trees Rice: 0.4 ha	Tea: 18,000 trees Rice: small scale	Tea: 12,000 trees Small shop	Tea: 26,000 trees
Is rice purchased?	Rice is purchased when harvested rice is finished.	Same as tea farmer 1	All rice is purchased because rice is not cultivated.	Same as tea farmer 3
Tea cultivation (common to all four farmers)	They have cultivated tea since 1996. They used to cultivate upland rice before starting tea cultivation. Cultivation density is 50,000 tree/ha. Neither chemical nor organic fertilizer is used. All harvested fresh leaves are sold to processing companies. Each farmer brings leaves to three processing factories. Daily labor is hired between February to May. The wage is 25,000 Kip if lunch is provided, or 30,000 Kip if lunch is not provided.			
Others	Chicken and ducks are reared as livestock, as there is no space for grazing cows and pigs.			

Source: Interview with farmers on November 1, 2011.

Note: The village in question is the Sengsaly village in Phongsaly district. It is centrally located and is comparatively well-off.

### (3) Processing Companies

Processing companies in Phongsaly province are listed in Table A2-6. The following three companies

are well-established in the province.

Lao Syuen was founded in 2006. It renovated one of its factories in June 2011. It produces 200 ton/year. It has the highest processing capacity and produces the best quality leaves in the province. It sells the product to one Chinese trading company only. Production in 2011 was estimated to be 100 ton. It already produces roughly processed tea and red tea, and is currently venturing into the production of green tea. Sales of red tea have recently increased, with this type of tea accounting for one-third of all sales at present.

Phoufa was founded in 1999. A cooker and dryer at its factory can each process 2 ton/day on a fresh leaf and dried leaf basis, respectively. It produces roughly processed tea leaves and red tea leaves. Sales of red tea increased in 2011, accounting for 60–70% of all sales in 2011. Thirty percent of red tea is exported to China, and the rest to Italy. Roughly processed leaves are sold to China as raw material for Puer tea.

Phongsaly Green Tea is the most recently established processing in Phongsaly district. It processes 2.5–2.7 ton/day on a fresh leaf basis. The utilization ratio of its factory is approximately 50%. It produces roughly processed tea leaves and green tea leaves.

In addition, there is one other company operating a factory and two others planning establishment of one factory each in Phongsaly province. It can be said that the tea processing industry is fairly active in Phongsaly province.

**Table A2-6 Tea Processing Companies in Phongsaly Province**

Processing company	Overview
Lao Syuen	Of Malaysian origin Produces roughly processed tea leaves and red tea leaves Production of green tea currently underway Capacity of 200 ton/year on a dried leaf basis Leaves sold to one Chinese company only
Phoufa	Of Chinese origin Produces roughly processed tea leaves and red tea leaves Cooker capacity of 2 ton/day on a fresh leaf basis Dryer capacity of 2 ton/day
Phongsaly Green Tea	Of Laotian origin Contract farming practiced in Bountai and Samphan districts Produces roughly processed tea leaves and green tea leaves Capacity of 2.5–2.7 ton/day on a fresh leaf basis
Gong Fulinsan	One factory present in Bounnua district Holds tea plantation in Bounnua district
Ya Tong	Cultivates tea in Gnotou district Plans to establish a factory
Land Sun	Plans to establish a factory in Lak 18 village-cluster in Phongsaly district

Source: Interviews with locals with the requisite knowledge.

#### (4) The Potential and Challenges on Tea in Phongsaly Province

##### The Potential

- Presence of necessary players: The farmers, processing company, and local authority are keen to promote the tea industry in the province.
- Processing capacity: The processing capacity of the province stands at 500 ton/year on a dried leaf basis. Compared to the processing capacity of other countries, it is comparatively small. However, 500 tons of dried leaves can produce 500 million bottles of tea drink, which means that

500 tons is a sufficient amount.

- Availability of areas suitable for cultivation: There is plenty of available area for tea cultivation. In addition to 3,106 ha of cultivated land, over 1,500 ha of cultivable land exists. It would be possible to produce an additional 750 ton of dried leaves from the 1,500 ha.
- Quality of fresh leaves: The intrinsic quality of tea leaves cultivated in Phongsaly province is very high and even surpasses that of the leaves from Puer city.
- Organic cultivation: Thus far, there has been no use of chemical fertilizer or other chemicals during cultivation. In other words, farmers have been practicing organic cultivation.
- USP to attract consumers: The northern-most province in Laos, Phongsaly province is characterized by pristine nature, including unique and ancient wild tea trees. It may be possible to create a storyline about the mystery and origin of tea to attract consumers to the product.

### The Challenges

- Incorrect cultivation techniques and prevalence of plant disease: The farmers, processors, and local government need to be educated about appropriate tea cultivation techniques. For example, the cultivation density of 38,000–49,800 trees/ha is too high and fertilization is not practiced.<sup>131</sup> As a result, there is a degradation in fertility, and the growth of tea trees has diminished leading to poor quality of tea leaves. In addition, the crop is prone to becoming diseased.
- Lack of a technical resource on cultivation technique: There is no expert or specialized institution specializing in tea cultivation in Laos.
- Poor marketing and limited sales channels: Processing companies barely market their products, and their sales channels are limited to particular Chinese companies. They are unaware about foreign markets and do not understand the buyers' needs.
- Limited processing technology: Thus far, processing companies have focused on producing roughly processed tea leaves only. As a result, the level of their processing technology and know-how is limited.

No expansion in tea cultivation: Processing companies have limited sales channels and therefore, maintain a low purchasing price for fresh leaves. The suppressed price is partially responsible for discouraging farmers from taking up or continuing tea cultivation. Therefore, price suppression is partially responsible for low cultivation volumes and yields.

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<sup>131</sup> A survey conducted by PAFO of Phongsaly province concluded that the appropriate cultivation density ranges between 25,000 and 30,000 trees/ha.

## Appendix 3 The Feasibility of the Plan to Develop a “Special Agricultural Zone” in Lao PDR

The JICA Study Team conducted an additional survey from mid-January to mid-February on “Special Agricultural Zone Lao Model (SAZLM),” which is advocated by a Japanese NPO.

After reviewing the SAZLM plan, this report discusses the following three aspects. First, the institutional framework of the Special Economic Zone (SEZ) in Lao PDR is discussed. As long as the SAZLM enjoys the status of a “special zone,” the area should have some privileges authorized by the Lao government. Similar ongoing institutional frameworks and agricultural policies have to be considered. Second, the current situations of Thoulakhom district, Vientiane province, are discussed. The Ministry of Agriculture and Forestry presented the district as a candidate for SAZLM. Unless the agricultural potential of Thoulakhom district is high, it is difficult to expect private investment to promote SAZLM. Problems that the site may face are important information for realizing SAZLM. Third, the possibility of Japanese private investment is discussed; this seems to be the key factor of SAZLM. Finally, the feasibility of SAZLM is discussed.

### A. What is Special Agricultural Zone Lao Model (SAZLM)?

SAZLM has the following three objectives: (1) providing agricultural products grown in the favorable agricultural environment of Laos to urban areas in the Indochina region, (2) establishing the agricultural country brand of Laos through safe foods produced in Laos, and (3) transforming Lao agriculture from self consumption farming to commercial agriculture with a competitive edge.<sup>132</sup>

In this regard, the following approaches are proposed:

- (1) Setting up the Special Agricultural Zone and developing agricultural products and processed foods with Japanese private investments for quality improvement, technology innovation, and facility installment
- (2) Supporting Laos to establish itself as an agricultural country in ASEAN
- (3) Expanding the opportunities for Japanese private companies to start business in Laos

The following activities are proposed to promote SAZLM:

- (1) Controlling strategies and activities in SAZLM by the newly established Joint Coordination Committee in order to avoid overexploitation
- (2) Making decisions on the location of the Special Zone and supervision of producing “The guideline of investment in the Agricultural Special Zone” for Japanese businesses by the Joint Coordination Committee
- (3) Support for farmers for enhancing agricultural productivity by an established management body of the Zone
- (4) Coordination between Japanese businesses and Laos to protect the benefits of both by a management body

The Japanese NPO and Lao Ministry of Agriculture and Forestry discussed on SAZLM unofficially. MAF proposed the Thoulakhom district in Vientiane province as a site for SAZLM.

### B. Special Economic Zone and Area Focused on Agriculture

There is no established concept or legal definition of “Special Agriculture Zone” in Laos. However, as long as it is a special zone, it should be treated as “a certain geographic area for which special

<sup>132</sup> Japan Laos Culture and Economic Exchange Association. *Outline of the Development Projects on Special Agricultural Zone Lao Model*.



institutional privileges are offered” and not just a simple target area of a project. For example, in Japan, when special zones are discussed in the context of structural reform special district law of 2003, they imply an “area in which some regulations are specially eased.” As governmental regulations on agriculture in Japan and Laos are different, definitions of a special agricultural zone in Lao PDR are necessary.

First, reviewing the current institutional framework of special economic zones is necessary. Although the main report of this study also refers to special economic zones in Laos, this appendix discusses special economic zones focusing on SAZLM. Then, a similar MAF policy in which specific geographical areas are defined to support farmers is discussed; this is different from special economic zones, but is necessary to review.



Figure A3-1 Location of Thoulakhom district

### (1) Institutional Framework of Special Economic Zones

As discussed in 3.5.5 in the main report, a special economic zone is regarded as a kind of investment. In some countries, the establishment and construction of special economic zones is undertaken only by public sector and the private sector just utilizes it. However, in Laos, the infrastructure for many special economic zones has been funded by the private sector.

According to the International Monetary Fund, the national gross domestic product of Laos is 6.3 billion US dollars and it is ranked 163rd in the world in 2011. In 2008, the GDP per capita was merely 934 US dollars and the population was 6.32 million. This population and economic position makes its governmental budget insufficient to fund infrastructure construction. This is why the Lao government expects private investment for the construction of special economic zones.

The governmental organization in charge of special economic zones is the Lao National Committee for Special Economic Zone Secretariat Office, in the Prime Minister’s Office. According to the Secretariat,<sup>133</sup> there is a strategy that emphasizes three aspects: (1) new city construction, (2) tourism, and (3) industry. According to the Secretariat, when the strategy is applied to special agricultural zones, Special Agricultural Zone may be closest to the “industry” category; however, there has been no special agricultural zone thus far.

According to the secretariat, in general, a special economic zone has a double structure of developer and investor. A developer, who funds the construction of the zone, applies to the Secretariat. Once the application is approved by the Secretariat, they develop the zone and wield strong power in terms of controlling the zone. An investor—who becomes a part of the zone—enters into a contract, not with the Secretariat, but with the developer of the zone.

<sup>133</sup> Interview with Dr. Malaykham Sayakone, Acting Director of International Relations and Cooperation Division, S-NCSEZ on February 6, 2012.

Authorized special economic zones enjoy several preferential treatments. For example, according to the International Relations and Cooperation Division, S-NCSEZ, taxes on imported machinery for manufacturing is exempted and business license is acquired rapidly owing to the “one-stop service” in the zone. In Prime Minister’s Decree No. 443 on October 26, 2010, the following preferential treatments are referred to:

- ✓ Special privileges on tax and duty. The Administration Committee or the Economic Executive Board of the SEZ is charged with considering the exemption or reduction of the rates of custom duty and taxes of various types to be granted to the investors based on the sectors, activities, size of investment; however, the maximum exemption or reduction rates shall not exceed the rates provided in the Customs Law and Taxation Law.
- ✓ Receiving exemption of duty and tax on the import of fuel during the construction period for the developers of SEZ located in remote areas and in areas with difficult geographical conditions (not the SEZ in general); it is required that the annual import plan is made, which is to be considered by the NCSEZ.
- ✓ Import of raw materials from within Lao PDR for use in various activities of the SEZ shall be considered as export of goods and shall be entitled to receive duty and tax privileges in accordance with the laws.
- ✓ Having promotional privileges through land use rights and ownership of other fixed assets as in accordance with Article 58 of the Law on Investment Promotion.
- ✓ Receiving the right to reside in the territory of Lao PDR along with the family during the period of the development investment contract.

Strictly speaking, special economic zones are of two types: special economic zone and specific economic zone. According to Prime Minister’s Decree No. 449, a specific economic zone is a specifically characterized geographic area, while a special economic zone is a newly developed area of more than 1000 ha, and may include multiple specific economic zones in it.

**Table A3-1 Comparison of Specific and Special Economic Zones**

	Specific economic zone	Special economic zone
Definition	Fixed geographical boundaries	Fixed geographical boundaries. A special economic zone may combine many specific economic zones. The areas must be over 1,000 ha.
Management	Managed by an Economic Board (Chaired by developer)	Managed by a Management Board (Chaired by government) and an Economic Board (Chaired by developer).
Investment	<ol style="list-style-type: none"> <li>1. 100% government</li> <li>2. Joint venture (government and private sector)</li> <li>3. 100% private</li> </ol>	<ol style="list-style-type: none"> <li>1. 100% government</li> <li>2. Joint venture (government and private sector)</li> </ol>

Source: Modified presentation materials entitled “Special economic zone development and management in Lao PDR” by Ms. Bouatha Khatthiya, Director General, NCSEZ, January 2011.

As of February 6, 2012, the NCSEZ has authorized nine special or specific economic zones.

**Table A3-2 Authorized Special and Specific Economic Zones (February 6, 2012)**

Name	Category	Province	Public investment	Objectives
Savan Seno	Special	Savannakhet	Yes	Trade, service, industrial park
Boten Dankham	Special	Luangnamtha	No	Trade, service,
Golden Triangle	Special	Bokeo	No	Trade, service,
Vita park (VTE industrial and trade area)	Specific	Vientiane C.	Yes	Trade, industrial park
Phoukhyo	Specific	Khammouan	No	Trade, service, industrial park
Xaysattha	Specific	Vientiane C.	Yes	Industrial park, commerce
Vientiane Naramit (Dong Phousy)	Specific	Vientiane C.	No	Trade, service
Boungthatloaung	Specific	Vientiane C.	No	Trade, service
Goflongthang (Dong Phousy)	Specific	Vientiane C.	No	Trade, service

Source: Interview with NCSEZ official on February 6, 2012

Three zones out of nine are large-scale special economic zones and others are specific economic zones. Developers with 100% private investment are present in six zones; joint developers of private business and governmental organizations are present in three zones. Out of 100% privately invested zones, Boten Dankham and Golden triangle special economic zones are developed by Chinese businesses. Phoukhyo specific economic zone in Khammuane province is funded by private investment. From among joint developer cases with public/private investment, Savan-seno special economic zone is developed by a joint venture between Savannakhet province and Malaysian business. The zone is a large-scale special economic zone with three sites. Three Japanese companies have been investors. The remaining two joint type zones are located in the Vientiane capital. One of them is developed by a joint venture with the Lao government having a 30% share and Taiwanese business having a 70% share. S-NCSEZ is targeting 14 to 20 SEZs established until 2020.

If the special agricultural zone is constructed under the institutional framework of a special economic zone, who will develop it? From an institutional viewpoint, it is possible for governmental organizations such as MAF and Vientiane provinces to become developers independently or with private business, as long as they have sufficient funds.

According to NCSEZ, although there is no category of special agricultural zones thus far, if applicants consult with NCSEZ, such zones may be able to be authorized as a new category.

## (2) Areas Focused on Agriculture

In this section, an MAF area policy focused on agriculture is discussed. According to the Agriculture department of MAF, seven large plains in the country were identified as high potential areas for agricultural production.<sup>134</sup> MAF named these areas as “Areas Focused on Agriculture” (AFA) and established a supporting committee within the ministry last year. This is a kind of production promotion policy with irrigation. Vientiane Capital, Vientiane, Borikhamxay, Khammuane, Savannakhet, Saravan, Champasak, and Attapeu provinces are involved. Rice, corn, vegetable, coffee, fruits, sugarcane, cassava, soybean, and tea are promoted to enhance their production.

Members of the support committee include deputy directors of each department, and every member is a leader of a specific area. For example, Vientiane province is lead by the deputy director of the Agriculture Department.

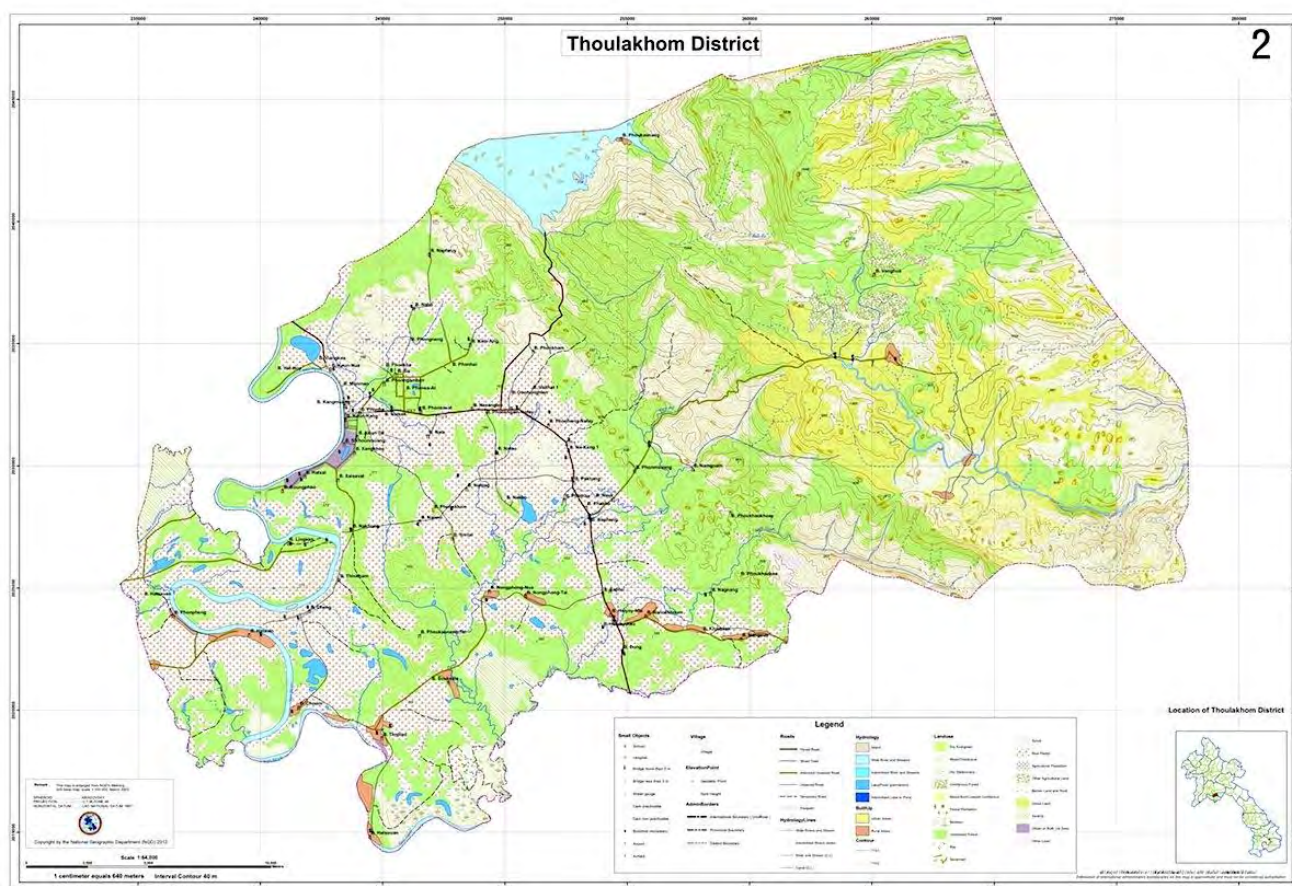
As areas in Vientiane province and the Vientiane capital are already irrigated, they are expected to be a model for other areas. In Vientiane province, approximately 3,000 ha are already irrigated and an additional 2,400 ha will be irrigated when current construction is completed. AFAs in Borikhamxay,

<sup>134</sup> Interview with Mr. Kham Sanatem, Deputy Director General, Department of Agriculture, Ministry of Agriculture and Forestry on February 3, 2012

Khammuane, Savannakhet, Saravan, Champasak, and Attapeu provinces are still in the planning stage (Borikhamxay area has a demonstration plot).

Thoulakhom district in Vientiane province, which was proposed as a site candidate by MAF is a part of the AFA. In addition, Thoulakhom district is described as cutting edge with gravity irrigation.

It should be noted that AFAs are under a totally different institutional framework. AFA is a kind of production promotion policy but tax and duty are not exempted and regulations are not relaxed. Thus, if SAZLM is constructed in Thoulakhom district, it should be placed within the current AFA with some preferential treatments as a special zone. The current situation of Thoulakhom district is reviewed in the next section.

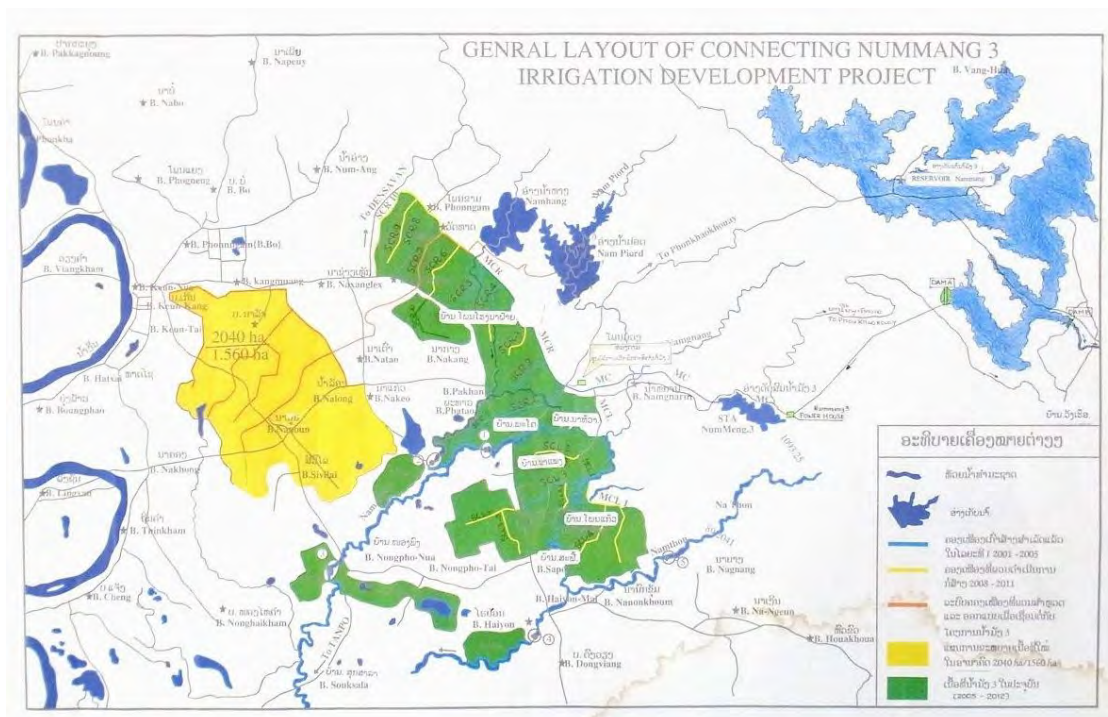


Source: National Geographic Department, Ministry of Home Affairs

Figure A3-2 Map of Thoulakhom district

### (3) Thoulakhom District in Vientiane Province

Thoulakhom District is in the southern part of Vientiane Province, less than an hour and a half's drive from Vientiane, the national capital. The total area of Thoulakhom is approximately 9,000 ha, and it is located in the downstream of Nam Ngum Dam, which was constructed with the support of many donors, including Japan. According to the District Agriculture and Forestry Office, until 2005, farmers cultivated rain-fed rice only in the rainy season and could not plant in the dry season. In 2005, Nam Mang 3 Dam was completed with Chinese financial support, and 2,040 ha in 13 villages were irrigated (Nam Mang irrigation scheme).



Source: Technical Support Center for Irrigated Areas

Figure A3-3 Irrigated Areas in Thoulakhom district

In addition, the Nampord River irrigation scheme, funded by Chinese loans, has recently been implemented. The scheme will irrigate 8 villages (1,065 ha). This construction will be completed in 2015. The total irrigated area in the province, including the Nam Mang irrigation scheme, will be 3,600 ha. Both irrigation systems use the gravity irrigation method. The scale of gravity irrigation seen in this area is rare in Laos. The major crop is rice, but the Laotian government would also like to promote livestock production and aquaculture. In the figure above, the green area is the Nam Mang irrigation scheme site and the yellow area is the Nampord irrigation scheme site.

Vientiane Province is encouraging private investment in agriculture. The mechanism promoted is as follows: “Land and Labor” are provided by farmers and “Funds, Technology, and Markets” are supposed to be provided by private businesses. The private businesses recover their investment by selling the agricultural products. This is a farmer-support system that functions not by governmental subsidy or technical assistance but by private investment. In Thoulakhom District, two companies have invested in agriculture. Both companies are located in Vientiane Capital; the former has been investing in agriculture for a long time and has conducted a contract with farmers farming a total of 100 ha in Thoulakhom District;<sup>135</sup> the other is a new company and has contracted with farmers farming 170 ha in the district.

There is another type of investment done here by private businesses: not directly investing in agricultural production but instead constructing a processing factory and procuring agricultural products from the vicinity. One Laotian company has contracted with local farmers to purchase their sweet corn to process it in a factory in Thoulakhom District.<sup>136</sup>

Vientiane Provincial Agriculture and Forestry Office supports farmers on irrigated land through the

<sup>135</sup> According to an interview with Mr. Khambeing Laoungaphay, Suvanthong Agriculture Development Sole Co., Ltd., conducted on February 8, 2012, loans by the Agricultural Promotion Bank are available, but the amount is limited and farmers spend the money only for hired tractors. The company loans money for fertilizer and recovers it by marketing the resulting agricultural products.

<sup>136</sup> Lao Agro Industry (LAI). Quod vide section 6.2.2 in the main report on contract farming by LAI.

Technical Support Center located 15 km from the District Agriculture and Forestry Office. The Center does a great deal of work for organizing farmers. Water-users' groups and production groups have already been organized, but according to the Center, they are not necessarily strong organizations.

As irrigation in Laos often involves pumping water up from rivers, farmers have to pay 600,000 kip per month for electricity. However, the irrigation method in Thoulakhom District is gravity irrigation. Under this system, farmers need to pay just 120,000 kip per month for canal maintenance.

Paddy rice is overwhelmingly the major crop in the area now, but sweet corn and dent corn are planted along the Nampord river, 500 ha and 700 ha respectively. Vegetables are also planted. According to the leafy-vegetable growers, the climate and soil conditions of the area are suitable for vegetable production. According to representatives of the water-users' groups, the following are produced: pumpkin, chili peppers, ginger, eggplants, and lemongrass. The Technical Support Center staff says that cucumber, watermelon, and tomato are also suitable to grow there. According to a document prepared by the District Agriculture and Forestry Office, banana, cowpea, tobacco, papaya, sweet potato, sugarcane, peanuts, and cabbage are additionally grown in the area.

In short, Thoulakhom District has relatively high production potential in terms of soil and climate conditions, except for some temperate crops that require a cooler temperature to grow. Considering that there are currently not so much areas where gravity irrigation is available, Thoulakhom District seems to be a high-potential agricultural area and suitable for being designated a Special Agricultural Zone.

However, there are some infrastructure problems in Thoulakhom District. Some surrounding roads in irrigated areas are not paved, and transportation is difficult in the wet season. According to the District Agriculture and Forestry Office, total distance to be paved is 50 km. Last year, however, the Laotian governmental budget covered just 5 km, and there is currently no clear plan for further pavement. In terms of electricity, all facilities for all communities have already been constructed and are waiting for power. Domestic water is available in nine communities in the central part of the district. Water itself is sufficient, but water purification and drainage systems for other areas need to be constructed.

Last, the distribution routes from Thoulakhom District are as follows: When products from Thoulakhom District are exported to Thailand or other countries, they are transported on National Road No. 10 spending less than an hour and a half to get to the capital. Some provincial roads within Thoulakhom District still need to be paved, but National Road No. 10 is well constructed and maintained. Products go into Thailand through the Thanaleng–Nong Khai border gate and reach Bangkok on the same day if they start from Thoulakhom District early in the morning. They are shipped from Bangkok port or Laem Chabang port to other countries. The distance and road conditions to Bangkok from Bolaven plateau, which is an established vegetable and coffee production area in Laos, and those of Thoulakhom district are almost the same.

#### (4) Viewpoint of Japanese Businesses

When a Special Agricultural Zone is established in an area with high production potential, do Japanese companies expand their business to the Zone?

The number of Japanese companies operating agricultural businesses in Laos is limited. The staff of one Japanese company that has already been working in agricultural production in Laos expressed interest to the SAZLM. They are coping with all their problems on their own at present, and it would be desirable if preferential conditions for these companies were established in the Zone. However, they have already begun working in their current sites and they might not be able to move from their present sites to the newly constructed Zone.

Generally speaking, it seems undesirable to assume that many Japanese companies will begin doing business in the Special Agricultural Zone. To begin with, private businesses that get engaged in agriculture are rare in Japan, and many of the Japanese companies operating agricultural businesses in Thailand and Vietnam mainly to export processed products to Japan do not seem to have a strong interest in expanding their businesses to outside of their current areas of operations so far.

However, some Japanese businesses operating in neighboring countries are bringing Laos into view to some extent. For instance, the Japanese Chamber of Commerce in Bangkok sent a mission to Laos last year.

According to one participant in the mission, most member companies seemed to have interest in Laos as a target not for investment but for marketing. According to the participants, there are many Japanese companies procuring agricultural products in Thailand, but it is not rational to procure materials from Laos given the high transportation cost to Thailand. On the other hand, the public perception that Laotian farmers do not use chemicals heavily can be used when marketing their products.

### C. The possibility of an Special Agricultural Zone

#### (1) Who develops the Special Agricultural Zone?

Institutionally, it is possible to construct a Special Agricultural Zone in which agricultural and food-processing businesses are promoted, under the definition of a special or specific economic zone by the Laotian government. In this case, investors in the zone can enjoy preferential treatment. But as there is not yet any precedent, developers in a Special Agricultural Zone need to discuss terms beforehand with the Secretariat of the National Committee for Special Economic Zones in terms of possible preferential treatment.

Both private businesses and governmental organizations such as the Vientiane provincial government and the national Ministry of Agriculture and Forestry can act as developers in the institutional context of a Special Agricultural Zone. The most significant criterion with regard to developer, however, is whether it has the desire to devote actual funds to the Special Agricultural Zone. Private investment is widely encouraged in Laos, because government funds are limited. Thus, if there are private companies that wish to invest in the Special Agricultural Zone, this project may be realizable.

When private investment is difficult to secure, donor funds can be considered next. There is no case in which a donor itself has become a developer in a special economic zone. However, if a donor directs funds through the Ministry of Agriculture and Forestry or the Vientiane provincial government, they may be able to act in a developer role for the Special Agricultural Zone.

Laotian government organizations should try to persuade donors to act in the role of developers of the Special Agricultural Zone. Japanese official development assistance, for example, is based on the principle of a request by a recipient country. Thus, Laotian governmental organizations will have to make requests through the Laotian central government.

If the Special Agricultural Zone is to fulfill its potential as a special economic zone with preferential treatment for the right developers, the Laotian Ministry Agriculture and Forestry has to go beyond current policy frameworks to promote the Special Agricultural Zone model. Present policy in “the Areas Focused on Agriculture” is essentially one of agricultural production support based on irrigation schemes. The ministry needs to discuss with the Secretariat of the National Committee for Economic Special Zone on the possibility of institutional arrangements for a Special Agricultural Zone in Thoulakhom.

Higher powers within the Ministry of Agriculture and Forestry could lead the Special Agricultural Zone project, on the model of the initial involvement by the former prime minister. The prime minister's office, for instance, may be able to organize a Special Agricultural Zone promotion committee centering around the Ministry of Agriculture and Forestry.

Discussions on Special Agricultural Zones so far have been for tangible geographical areas as industrial parks. A Special Agricultural Zone based only on institutional arrangements for preferential treatment can also be considered. In that case, heavy investment and construction would not be demanded; in any case, however, institutional arrangements should be implemented far beyond the present policy framework of the Ministry of Agriculture and Forestry to make these zones truly "special."

## (2) Can Japanese businesses move into an Special Agricultural Zone?

When a company would like to do business in a special zone, it is common to look for advantages in the location, not limited to the provision of preferential treatments. Typically, the site should be close to market, for example. If a Special Agricultural Zone is established in Thoulakhom District, it will benefit from being close to a production area. When a business needs to procure fresh vegetables for processing, this accessibility will be a strong advantage. As already discussed, Thoulakhom District has relatively high potential in terms of agricultural production, and this may help it attract Japanese businesses.

The current state of agriculture in Thoulakhom District, however, has a problem. Agricultural businesses generally rely on experienced farmers to lead production. However, most farmers in Thoulakhom District do not have sufficient experience to produce crops other than rice. They are producing various kinds of crops, but they have just started and production is not necessarily stable. Japanese businesses looking at the district will consider the time and cost needed to organize and train farmers.

Governmental or donor -supported projects for production of crops other than rice could solve this problem. After a certain amount and quality of production are secured through public projects, Japanese businesses might consider investment, for example, in a processing factory in the area. This project is proposed in section 7.2 in the main report.

Indirect investment by Japanese businesses through Laotian partners could be another solution. For instance, one Laotian charcoal-manufacturing company is producing high-quality charcoal based on technology transferred by a Japanese partner and sells all the products to the Japanese partner. In agricultural and food-related industries, Japanese companies can invest in Laotian partners, offering technology and markets and minimizing the cost of technology transfer in production and organization of farmers.

As discussed previously, Japanese operation of agricultural and food related businesses in Laos is limited. This is because 1) the domestic market in Laos is smaller and poorer than that in Thailand or Vietnam, 2) production skills among farmers are low and production of crops other than rice is unstable, and 3) transportation costs are high since the country is landlocked.

Therefore, the SAZLM has to be attractive to Japanese businesses in terms of not only infrastructure but also institutional arrangements. In the SAZLM, preferential treatments should be offered without stinting. For instance, no custom clearance fee should exist at the border gate for preferred partners, and custom clearance procedures should be simplified. To realize these radical regulatory changes, the Ministry of Agriculture and Forestry needs to transcend its present policy framework, and it should work with other related ministries to do so.



### (3) Conclusions

Although Thoulakhom District in Vientiane Province has high potential as a center of agricultural production, it is not necessarily likely that Japanese companies will move into the SAZLM. To encourage Japanese investment, not only better infrastructure but also drastic institutional changes are necessary. Under the current legal situation, the Ministry of Agriculture and Forestry and Vientiane provincial government can play large roles as developers of the Special Agricultural Zone, but the largest role in development is in funding. If these institutions are not capable of funding activities at home, they need to ask for financial support from donors outside. In addition, the Laotian side has to transcend its current agricultural policy frameworks to realize drastic institutional changes to accommodate Japanese private businesses and attract them to invest in the Special Agricultural Zone.

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