PREPARATORY SURVEY
ON
BOP BUSINESS ON DEVELOPMENT OF FOOD SUPPLY CHAINS
IN
MYANMAR

FINAL REPORT

(SUMMARY)

June 2014

Japan International Cooperation Agency (JICA)

Retail Branding Co., Ltd.

Nippon Koei Co., Ltd.

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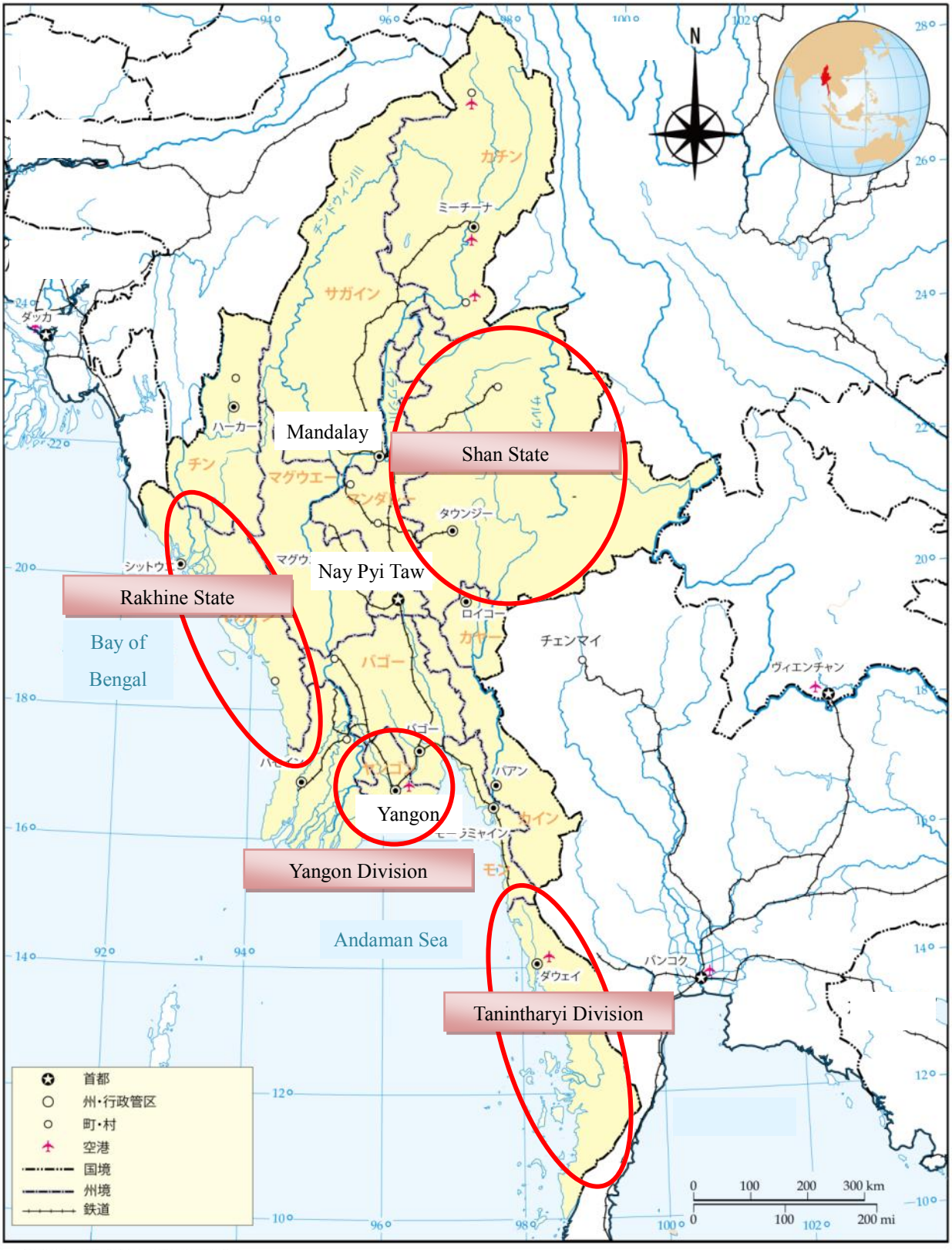


出典：国際連合の地図を基に弊社作成

Location Map

Preparatory Survey
on
BOP Business on Development of
Food Supply Chain
in Myanmar

Final Report
Summary

Contents

UNIT

Area	Weight and Volume	Currency （As of end of May 2014）
1 acre = 4,047 m^2 = 0.4047 ha 1 mi^2 = 2.59 km^2 = 640 acre 1 ha = 100 a = 10,000 m^2	1 viss = 1.633 kg 1 tin = 40.91 L	USD 1 = JPY 101.68 MMK 1 = JPY 0.106

Chapter1 Survey Outline

1.1 Background

The Myanmar economy has developed rapidly due to the relieved and lifted economic sanctions and foreign capital inflow after the general election in November 2010. At the same time, not only domestic but also the European, Japanese, and Thai have advanced into the Myanmar food service industry such as supermarkets and convenience stores. Therefore, the high potential of farming and fishing in Myanmar has massive needs for food processing and export. For the Japanese food service industry advancing to Singapore, Thailand, and Vietnam, Myanmar will also be beneficial.

However, cold chain such as refrigerator truck and refrigerator, and infrastructure such as road, electricity, and water supply are poor. This affects the food service industry in Myanmar. This means that it is difficult to have a stable supply of good quality agricultural and fishery products.

Therefore, a sustainable food supply chain, with Japanese Standards, for safe and secured food is needed in Myanmar, that could lead to exports to the Association of Southeast Asian Nations (ASEAN) and Japanese markets and not only in the domestic market.

Table 1-1 Business Outline (Initial Plan)

	Contents
Main Actor	Special Purpose Company (SPC)（including RB, NK, and others）
Initial Investment	JPY 200 million
Main Activities	Training for farmers and fishery workers; Construction of a logistics center annexed to a food processing factory; and management of supply chain and food sales
Target Area	Yangon Division, Ayeyarwady Division, Tanintharyi Division, and Rakhaing State (During the survey, Shan State was added but Ayeyarwady Division was excluded in the target areas)
Target Market	Myanmar domestic market and ASEAN market (Japanese food service industry, Myanmar and local food service industry): 600 stores, Japanese market (RB clients): 600 stores
Expected Revenue	JPY 2,820 million (Payback Period: 5 years)

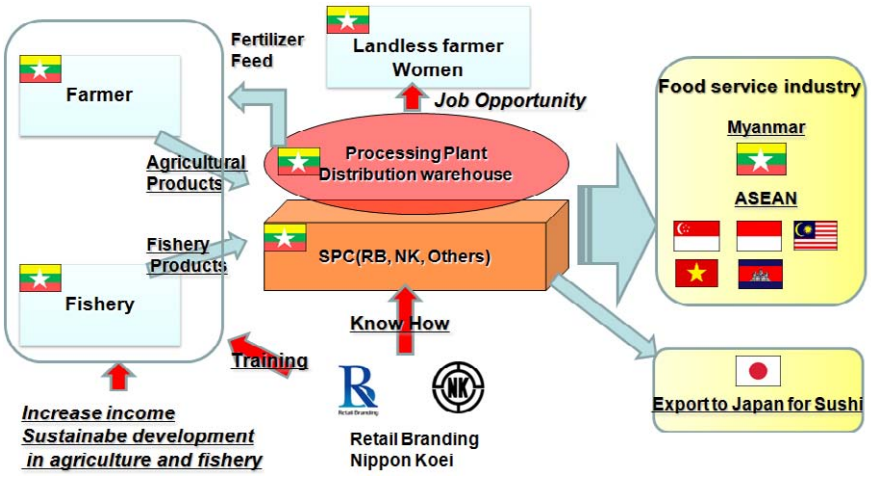


Figure 1-1 Business Image

1.2 Objectives

The objectives and survey subjects are shown as follows:

- ✓ To formulate BOP business model and plan.
- ✓ To consider the feasibility of cooperation with Japan International Cooperation Agency (JICA) project.
- ✓ To predict the effect of development through the business.

(1) Preliminary Survey

(2) Field Survey

1) Survey in the production sites
2) Survey of potential food processing site and warehouse site
3) Survey of distribution
4) Marketing survey
5) Survey of local laws and regulations

(3) Formulation of business model and business plan

1) Selection of priority products
2) Consider the suitability of production site
3) Consider recommended production technology for each product
4) Consider potential capacity of farming and fisheries (BOP class)
5) Consider the feasibility of franchise system for producers
6) Consider the necessity of loan to producers and the loan system
7) Consider how to cooperate with each actor within the food supply chain and others
8) Formulation of a business model for food supply chain
9) Formulation of the business plan

(4) Prediction of the effect of development and formulation of scenario to realize the effects

1.3 Survey Schedule

In the beginning, the survey period was from March 2013 to January 2014. However, it was extended until May 2015 since a new survey subject was added.

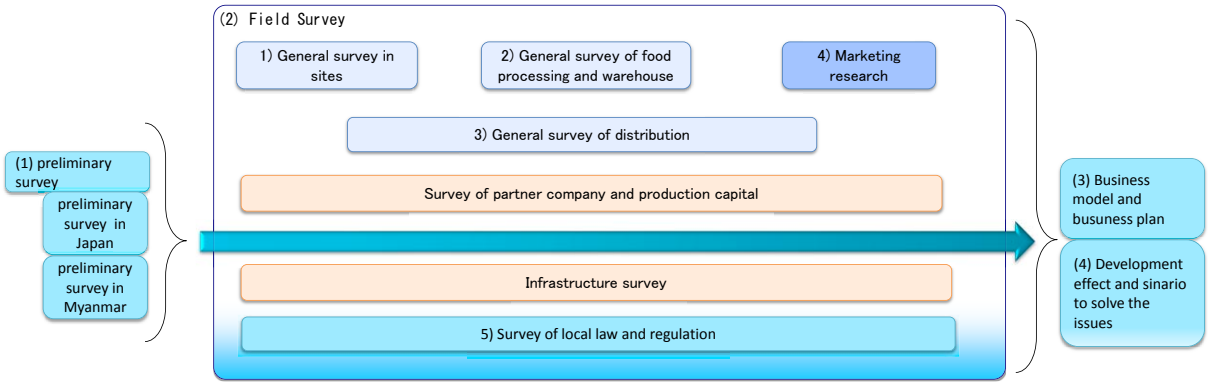


Figure 1-2 Survey Schedule

Chapter2 Business Environment

2.1 General Information

The Tanintharyi Division, Rakhaing State, Yangon Division, and Shan State are the targeted areas in this survey.

Tanintharyi Division, which is fronting Andaman Sea, has the second highest catch in fisheries next to Ayeyarwady Division. Also, Tanintharyi Division has an active distribution with Thailand because they are neighbors. The Department of Fisheries regards Tanintharyi Division as an important area for sea culture, and in its provincial capital, Dawei, ports and harbors are developed and main road construction to Bangkok is also planned.

Rakhaing State, which fronts the Bay of Bengal, is famous for cultured *Penaeus monodon* and has the most production of these species in Myanmar. Although the rainy season may affect their transportation, the recent road development will enable distribution all year round.

Yangon Division is the center of Myanmar economy. Fishery products coming from the whole country are collected in fishing ports in Yangon and are processed around the port and exported. Furthermore, Yangon International Airport and Thilawa Port connected to some big cities by road enable agricultural and fishery products to be transported.

Shan State, which is the largest area among the 14 divisions and states, is doing active border trade with China, Thailand, and Laos.

2.2 Climate

The climate of Myanmar depends on the region because the land extends from north to south. For example, the south coast of Yangon has tropical monsoon climate and inland has savannah climate with less than 1,000 mm rain. The mountain area from east and north is colder than the plain area and has humid temperate climate with 1,500～4,000 mm rain. Climate should be distinguished into three seasons, namely: dry season (end of February to middle of May), rainy season (end of May to middle of October), and cool season (end of October to middle of February).

2.3 Population

According to Myanmar statistics, in 2011, the population of Myanmar was 5,913,000 people and the population density was approximately 87 people/km^2. Mandalay Division has the highest population with 830,000 people, but Yangon Division has the highest population density.

2.4 Politics and Economy

Thein Sein was elected President in March 2011 and he has promoted democracy. In April 2011, he adopted new policies such as currency exchange rate, foreign investment laws, and taxation. Agriculture is the main industry in the country, accounting for 63% of the population.

Therefore, the government pays more attention to the development of agriculture. Regarding trade, Myanmar has posted trade surplus for nine years, but it has decreased by 26.3% year on year. The Greater Mekong Subregion Development Program is a significant initiative for infrastructure development in the North-South Economic Corridor, East-West Economic Corridor, and South Economic Corridor.

2.5 Foreign Investment

Under the Foreign Investment Law in November 2012, the Myanmar Investment Commission (MIC) was established. In 2013, MIC notification provides activities that fall under the category of "restricted or prohibited business". There are 21 non-permitted activities, 42 activities which require a Myanmar JV partner, 115 activities which require obtaining Union Government approval, 27 activities which require various special conditions, and 34 activities which require environmental impact assessment (EIA). Ministry of National Planning and Economic Development (MNPED) notifications represent a major step forward in terms of the foreign investment process and are providing clear parameters for what foreign investments are permitted and the conditions which are attached to them.

2.6 Japan Economic Cooperation

The Government of Japan changed its economic cooperation policy in April 2012. Japan agreed to provide official development assistance (ODA) in October 2011. The assistance field is shown as follows:

- Improvement of living standards;
- Capacity development and institutional development; and
- Improvement of infrastructure for sustainable development.

2.7 Related Laws and Regulations

2.7.1 Laws Relating to Agriculture

The Ministry of Agriculture and Irrigation (MoAI) is responsible for pilot farm operation. The operation requires obtaining approval from the ministry. However, owner has no choice for the site selection so it may be difficult to operate pilot farm with own capital.

The export of products requires permission from MoAI and the Ministry of Commerce (MoC). MoAI will permit if imported seeds are exported including "processing". In case of selling imported products in Myanmar, however, MoAI will not give permission if the "processing" is excluded.

Based on the foreign investment law, food processing business requires a Myanmar joint venture (JV) partner. Construction can be implemented with the permission of MoAI and MoC if dormitory for employees is constructed in the sites; however, special procedure is required with the permission from the Department of Human Settlements and Housing Development (DHSHD).

At present, the Food and Drug Administration is the permitting authority for quality and international trade of food and drug, so export of food requires permission from the administration.

The Environmental Conservation Law and Environmental Conservation Rules are the most important laws among the environmental laws. Also, specific procedure on EIA will be enacted.

2.7.2 Laws Relating to Fishery

The laws relating to fishery are as follows:

- Law Relating to the Fishing Right of Foreign Fishing Vessels
- Aquaculture Fisheries Law
- Myanmar Marine Fisheries Law
- Freshwater Fisheries Law

Chapter3 Agriculture Survey

3.1 General Information of Agriculture

MoAI is responsible for agriculture and irrigation and DoA is responsible for the production of vegetables and fruits, and extension of agriculture technique. Also, Yezin Agricultural University and Department of Agriculture Research are responsible for research of superior seeds production and soil analysis.

According to the statistics in 2009-10, agricultural land in Myanmar is measured at about 1,200,000 ha, accounting to 18% of the whole land area in the country. The agriculture, forestry and fisheries industry is the main industry in the country, accounting for 40% of the gross domestic product (GDP) and employing some 56% of the labor force. Main crops include rice, sesame, beans, rubber, and maize. Rice and beans are the primary exported products.

Manufacturing industry is less likely to grow significantly with 20% nominal GDP share, compared with the agricultural, forestry, and fishery industries with 30% nominal GDP share. Based on the composition of the private companies registered by the Ministry of Industry in 2009, 66% belong to the food stuff sector and their business involves primary processing such as rice mill, oil refining, and flouring. Most of them are domestic small and medium enterprises (SMEs).

The amount of export of agricultural products is USD 1,320,000,000, accounting for 20% of the whole export amount in 2009-10, following the export amount of natural gas. The export amount increased by four times in five years. Further increase is expected in the future.

3.2 Situation of Agricultural Production in Shan State

The area of Shan State is about 56,000 km^2 and the population is about 570,000 people. The agricultural area is 13,342 km^2, accounting for 11% of the whole agricultural area in Myanmar. However, agricultural area for irrigation is only 15% because of the mountain area.

The primary agricultural products are maize, soybean, garlic, and potato. In addition, vegetables (including cabbage, ginger, asparagus, and cauliflower), fruits (including mango and avocado), tea, and coffee have large production.

3.3 Selection of Target Products

Target products in Shan State are selected based on the situation of agriculture, features of the products, agricultural economics, distribution, and related organization. The strong and weak points for each product are shown in Table 3-1.

Table 3-1 Analysis of Target Products

Products	Current Situation/Strong Points	Current Situation/Week Points
Soybean (green soybeans)	・ There is a great need in Japan for green soybeans. ・ If soybean production transfers to green soybeans, mass production can be possible. ・ Because of existing food processing industries, they may be able to do business by themselves without massive investment.	・ Unimproved production techniques. ・ Unimproved technical extension system. ・ Unimproved seed supply system.
Ginger	・ There are needs for processed ginger (including red pickled ginger). ・ It is produced a lot in Shan State so it is possible to get a lot with low price. ・ Because of existing food processing industries, they may be able to do business by themselves without massive investment.	・ Technical improvement for ginger is required since the existing ginger is not suitable for processing.
Avocado	・ It may be possible to get a certain amount because of the increasing production. ・ Because of existing food processing industries, they may be able to do business by themselves without massive investment.	・ Rare avocado is impossible to export to Japan.
Asparagus	・ At present, a high quality of asparagus is produced. ・ The existing distributors are able to purchase a lot	・ Because of the small amount of production, it is difficult to make large-scale purchases.
Chrysanthemum	・ Producer's cooperative exists and already produces high quality of chrysanthemum so it is possible to get lots with high quality. ・ There are needs for chrysanthemum at funerals in Japan.	・ There is only one producer's cooperative leading to competitiveness.
Cabbage	・ Processing is already done so it may be easy to be involved in the business.	・ The business is already implemented so there is concern about the development.
Spinaches	・ Spinaches may be preferable for freezing processing to foods service industry in Japan. ・ Spinaches are already produced in Myanmar and sold to a Japanese restaurant.	・ Because of the small amount of production, selection method and technical cultivation method that meet the standards should be decided.

Source : Project Team

3.4 Agricultural Supply Chain

(1) Broker→Wholesaler→Retailer→Consumer

This is a typical agricultural distribution flow in Shan State. Example cases are soybean, ginger, and avocado. Aungban, the west part of Shan State, is the main market place where many wholesaler come.

(2) Through Agricultural Cooperatives

Chrysanthemum is a case of this supply chain. It is directly sold to wholesaler or retailer through the Horticulture Manufacturing and Production Association in Heho. Agricultural cooperatives often provide information on the production amount and cultivation technique for registered farmers, leading to effective distribution.

(3) Through Local Wholesaler

Asparagus is a case of this supply chain. It is sold with high price since it can be distributed directly without the market place. By hearing, a wholesaler, who sells asparagus, has sold the product in Yangon based on the order by phone.

(4) Through Food Processing Industry

Food processing industry often provides agricultural training, seed, and fertilizer. Cabbage is the case. Processed cabbage is exported overseas by trading company and distributed to consumer after the final processing.

Chapter4 Fishery Survey

4.1 General Information of Fishery

The fishery production in Myanmar was 4,720,000 t in 2013 (marine fishery: 52% and inland fishery: 48%). The fisheries production is increasing, especially in aquaculture production. In line with the increasing production, the rate of per capita fish consumption is 48 kg. About 9% of all landing is exported to seven counties.

The Department of Fishery (DoF) under the Ministry of Livestock and Fisheries (MoLF) is responsible for aquaculture, research and development, and budget management.

Generally, fisheries in Myanmar are classified into two categories, namely: inland and marine fisheries. Inland fishery includes: 1) aquaculture, 2) demarcated fishery, and 3) permitted fishery.

The overall fishery production is more than twice larger in the last decade. The volume of fisheries export increased from 74,000 t in 1997 to 376,000 t in 2012. The main exported products are fish. On the other hand, import commodities are herring and sardines for canned food.

Under the DoF, the section for research and development has been organized with the fisheries institution. However, it has low level of fisheries technique and insufficient equipment. The Myanmar Fisheries Federation (MFF) was established in 1998 to deal with fisheries industry and currently, the main body of the federation is composed of large aquaculture producers, fisheries producers, and fishery processing industry.

4.2 Situation of Fishery in the Target Area

4.2.1 Rakhaing State

Most shrimps in Myanmar come from Rakhaing State. The area of aquaculture is 44,358 ha, and is about 30,000 t. Natural aquaculture production is decreasing.

Sandway is the second biggest city in Rakhaing State and trawling is popular there. However, there are only two food processing plants in the area. Therefore, there are lots of small fishers using small trawls or seine.

In Kyaukpyu, there are lots of fishing villages around the island. However, there are only two food processing plants for frozen shrimp in the area.

4.2.2 Tanintharyi Division

Tanintharyi Division is the south part of Myanmar bordering with Thailand. Therefore, border trade is active between them. Especially in Myeik, many foreign ships are coming because of the abundant resources.

In Tanintharyi Division, offshore fisheries are the primary fishery, accounting for more than 70% of all fisheries. In Myeik, fish and shellfish are exported to Thailand. However, the fishery products are not so much distributed into the local market including Yangon. But

because of the road development from Prachuap Khirikhan in Thailand to Myeik, the duration of transportation is expected to be shorter and will become more convenient.

4.3 Economic Condition of the BOP

The Project Team had interviews in Thandwe, Rakhaing State in order to know the economic condition of the fishery worker. About 60% of the value of the landing goes to the owner and the fishery worker's earning is paid on the commitment. The value of landing depends on the day but about MMK 1,000～1,500 per day on average. During the fishery peak season, many fishery workers come from the north of the state. Women are engaged not only in housework but also in dried fish products, earning MMK 30,000～40.000 in a month. Fishery workers do not save money in the bank because of the limited number of banks around there.

Landing

Salt Down of Conger

The situation of the BOP in fishery is as follows:

- ✧ The BOP is not registered with the fishery cooperative
- ✧ The BOP is engaged with their boss (owner). Therefore, they are not allowed to sell their catch by themselves
- ✧ Illegal fishing by unregistered fisher

4.4 Selection of Target Fish and Shellfish

Securing stable supply is a precondition for the fishery business. Because of excessive fishing, natural resources such as clams, mantis shrimp, and lobster have to consider sustainable fishery including resource management. Furthermore, there is a concern about the distribution due to unstable quality and quantity as a result of the environment or climate. For stable supply, therefore, processing plant should be set up close to the aquaculture fishery area.
Target fishery products are shown in Table 4-1 below.

Table 4-1 Features of Primary Fishery Products

Species	Substance of Fishery	How to Catch	Situation of Fishery	Volume of Landing	Fishing Area	Origin
Octopus	insubstantial	Trawling	100 kg-1 ton in one sailing (two weeks)	Unknown	Craggy place, trawl area from costal area to offshore area	Sandway, Myeik
Soft Shell Club	substantial	Fishing baskets	Aquafishery of club	Decreasing in some area	Mangrove area	Rakhaing, Ayeyarwady , Myeik
Clam	substantial	Catch by hands	One local broker company in Yangon	Decreasing	Coastal area in sand area	Kyaukpyu in Rakhaing Division and Tango, Ayeyarwady
Mantis Shrimp・ Lobster	substantial	Gill nets	Selling after fattening, Many brokers	Decreasing in some area	Coastal area	Rakhaing and Myeik
Squid	substantial	Trawling and fish lamp	Processing for sushi; Squids are caught by fish lamp	Unknown	Coastal area	Rakhaing and Myeik

Table 4-2 Features of Primary Fishery Products

Species	Processing Area	Price	Stable Supply and Sustainability	Freshness	Feasibility of Japanese Market	Competitiveness to Japanese Company
Octopus	Myeik, Sandway	Low	Unstable, No octopus fishery, No data of resource amount	Bad at present	Feasible	Noncompetitive
Clam	Myeik, Sandway	Low	Unstable	Bad at present	Feasible	Noncompetitive
Soft Shell Club	Myeik	Average to high USD 15/kg	Aquaculture Stable at present	Good	Not well known but good taste	Competitive (Increase demand)
Mantis Shrimp・ Lobster	Myeik	High more than USD 30/kg	Stable at present	Good	Feasible	Competitive (Increase demand)
Squid	Myeik	Export squid for sushi	Stable	Good	Feasible	Competitive (Contract to the Japanese fishery company)

Source：Interview by the Project Team

4.5 Fishery Supply Chain

(1) Fishery Distribution

The typical fishery distribution in Myanmar is “Fisher→Fishing port (Jetty) →Wholesaler→ Market→ Consumer”. Therefore, there are many different distributors in this distribution.

(2) Feature of Fishery Distribution in Myeik

Myeik is the biggest border trade point and the fisheries products are carried to Ranoung in Thailand. The products are sold under negotiated transaction. Many fishery products are transported to Ranoung by registered freighter, whose registration is valid for three months and issued by the authority in Myanmar.

PPT and ASK, which are big fishery industries, transport their products to Penang in Malaysia by their own freighters. These products are transferred from Penang to other countries. On the other hand, small to medium fishery industries transport to Yangon by land. Freight charges are shown as follows:

- Export route：Myeik→Malaysia（Penang）→Japan
- Freight charge to Japan
  - ✧ 20 feat Container：USD 2,000
  - ✧ 40 feat Container：USD 4,000－5,000

Chapter5 Cultivation Test

5.1 Cultivation Test (Green Soybeans)

Permitted green soybeans imported from Japan were cultivated twice between June 2013 and December 2013.

As a result, it was not fully harvested, leading to low yields. This was because of the following problems: 1) unsuited species in the area and climate, 2) plant diseases during latter cultivation, and 3) unexpected heavy rain.

Farm

66 days after seeding, plant diseases

For high yield, it is required to find suitable species, season, management method, and dissemination method of cultivation technique.

Table 5-1 Issues and Lesson Learned for Green Soybeans Cultivation

	Issues	Lesson Learned
Yield	The yield and quality were low because of the feature of the plant and cultivation time, plant diseases, and soil	Although increasing yield is a priority, there are various issues to be solved. Therefore, selection of the priority will be needed. Cultivating season should be changed.
Species	In spite of the low yield, medium maturing variety grows more than the early maturing variety.	For the cultivation season, thermosensitive species seem to be more suitable than short-day plant. More suitable species should be selected.
Management	Cultivation management was implemented in accordance with local management methods but it was not fully managed because of the limited survey term.	It is required to organize the management methods by fertilizer and pest control.
Seeds	The Japanese seeds practiced in this survey were costly in terms of transportation and seeds from Taiwan have limitation in terms of the exported amount.	Consider the feasibility of gaining Taiwanese seeds in order to lower costs.
Technical Training	There was no training staff that can stay on a long term.	It is needed to train a local staff who can manage cultivation or to work in cooperation with agricultural school or laboratory.

Source : Project Team

5.2 Cultivation Test (Spinaches)

Spinaches have much demand for freezing in the Japanese food industry. Although it is already distributed in Myanmar to local Japanese restaurant, the production amount is very small. Therefore, in order to find the feasibility of cultivating these products which can be imported to Japan, the Japanese variety seeds were used and cultivated comparatively.

As for the cultivation condition, half used normal soil and the half used plowing soil. About 10 kg were yielded for each after 53 days. Both spinaches were small in size than expected. This is because of the lack of fertilizer and only dried cattle manure was used. Overall, the cultivation was relatively successful so continuous cultivation test and data collection for dissemination of cultivation technique will be implemented. Also, the cultivated spinaches seem to be preferable for the Japanese market in terms of color, size, and taste.

Cultivation Test of Spinaches

Cultivation Land

5.3Fishery Test (Octopus Fishery)

In order to determine the feasibility of octopus fishery, this test provided basket trap for catching octopus. Fishing was implemented three times from September 2013 to November 2013.

The caught fishery products are shown below. As a result, octopus was not caught in this survey.

1st : Many club and fishes were caught, accounting for three fishery products per basket trap.

2nd : Fishery products were rare because of the mud in the estuary.

3rd : Octopus was not caught even in the sandy area offshore.

A large number of fishery products were caught by basket trap. For octopus, however, fishing area has to be in sandy area. Introduction of fishery by basket trap enables the BOP to maintain their income in spite of the rainy season. PPT will practice octopus fishery to support the BOP in Myeik.

Chapter6 Research of the Partner Company

6.1 Agricultural Partner Company

6.1.1 Partner Company

The selection of the partner company was implemented with the Chamber of Commerce and Industry and MoAI by making a long list of candidate companies through the survey of their businesses.

The selected local partner company carries out the transaction without brokers, implements the contract with 200 farmers, purchases all the products, and provides technical training. The products after drying are exported to Korea. As a feature of the company, they tend to employ farmers' son in their processing plant to conduct education and training of fertilizer and pesticide application. Then, the employees can recognize processing method, merchandising process, and food hygiene, leading to dissemination and enlightenment of agriculture. This is considered to be a good system for the introduction of a franchise system.

Although there is no company certified with HACCP and ISO 22000・FSSC 22000 among the processing plants, they are conscious of the standards of hygiene management. The issues include electricity such as air conditioning of the storage warehouse and truck yard in spite of the importance of management of temperature and humidity.

6.1.2 Infrastructure (Electricity and Water)

Electricity supply is not stable in Myanmar. Therefore, food processing plant has its own power generator. The insufficient power supply is one of the reasons for the lack of air conditioner.

Within Naypyidaw, there is a plan to get from MoAI a permit for the land acquisition of a candidate area for a food processing plant. In that area, there is plenty of water. Although there is no water quality concern, it is required to carefully design an appropriate drainage channel and wastewater treatment so as not to flow wastewater into the irrigation area. Furthermore, it is also important to get advice on land acquisition from a trusted third party.

6.2 Fishery Partner Company

6.2.1 Partner Company

The selection of the partner company is implemented according to the following criteria:

- Registered with Myanmar Fisheries Federation and receives logistical assistance
- High production techniques
- Own processing plant or aquaculture farm in target area and active to cooperate with Japan
- Experience of trade overseas including Japan

Although there is no company certified with HACCP and ISO22000・FSSC22000 among the processing plants, they are conscious of the standards of hygiene management. The issues include electricity such as air conditioner in the storage warehouse and truck yard in spite of the importance of management of temperature and humidity.

6.2.2 Infrastructure (Electricity and Water)

Most of the processing plant is in Yangon because of the electricity required for a refrigerator. Myeik has only two diesel generators provided by the government and has no electricity interchange with Yangon. Therefore, electricity charge in Myeik is seven times costlier than in Yangon. In this survey, most of the processing plants have their own generators for refrigerator. According to a Malaysian company in Myeik, they came to Myanmar expecting cheap labor cost but some companies already left due to the current higher electricity charge and labor cost in the country.

6.2.2 Discussion of Food Supply Chain

The food supply chain is expected to export to Japan through their distribution route. The main cities of the supply chain will be Yangon and Myeik, which have head office and processing plant. Then, fishery products will be collected, processed, and exported through the existing distribution and new distribution.

On the other hand, Rakhaing and Ayeyarwady will transport products to Yangon which will then be exported. Also, Myeik will transport products throughout Thailand or Malaysia. In 2014, the road construction from Myeik to Bangkok will be completed, resulting in travel duration of six hours between them. This means that the distribution of Myeik will be definitely improved.

Chapter7 Marketing Research

7.1 Agricultural Marketing

In order to determine the feasibility of selling green soybeans in the Japanese market, the testing of frozen green soybeans was implemented with a local partner company. Green soybeans were processed and frozen in refrigerators and exported to Japan by air.

The green soybeans were provided to the Japanese food service industry. They pointed out the small size of the green soybeans but they totally evaluated them. Therefore, if the cultivation method is improved and the size is upgraded, it is possible to commercialize green soybeans in Japan.

Processing

Green Soybeans

7.2 Fishery Marketing

In order to evaluate the reaction of consumers and identify the changes in quality due to transportation from Myanmar, test selling of soft shell club and clam was practiced in the Japanese restaurants. After evaluating the taste, it was found that the soft shell club kept its quality because of the chilled transport, leading to a contract with a big family restaurant chain. The future issues to be solved include not only finding the delivery style (half cut, quarter cut, fried, etc.) based on the needs in the Japanese market, but also price setting and the timing of delivery. Regarding clam, 65% survived after 15 hours during transportation. Improving refrigerant and temperature management will raise the survival rate.

Packing of Clam

Japanese Restaurant (Rakura)

Chapter8 The Business Model and The Business Plan

8.1 Definition of BOP Business

The definition of improvement of food supply chain under this BOP business is as follows: "The BOP has a restricted access to market, information, education, and technique. By its involvement in the food supply chain, BOP business can stimulate job creation and improve agricultural technique and living conditions for those living in poverty. Also, it can develop the economy in Myanmar through sustainable agriculture".

In the previous chapter, the detailed survey was implemented for agriculture and fishery. As a result, the production and selling of frozen vegetables, mainly spinaches, were found to be feasible. Regarding fishery, octopus business was found to be not feasible because of unstable shipment and price. The role of BOP business is shown in Figure 8-1.

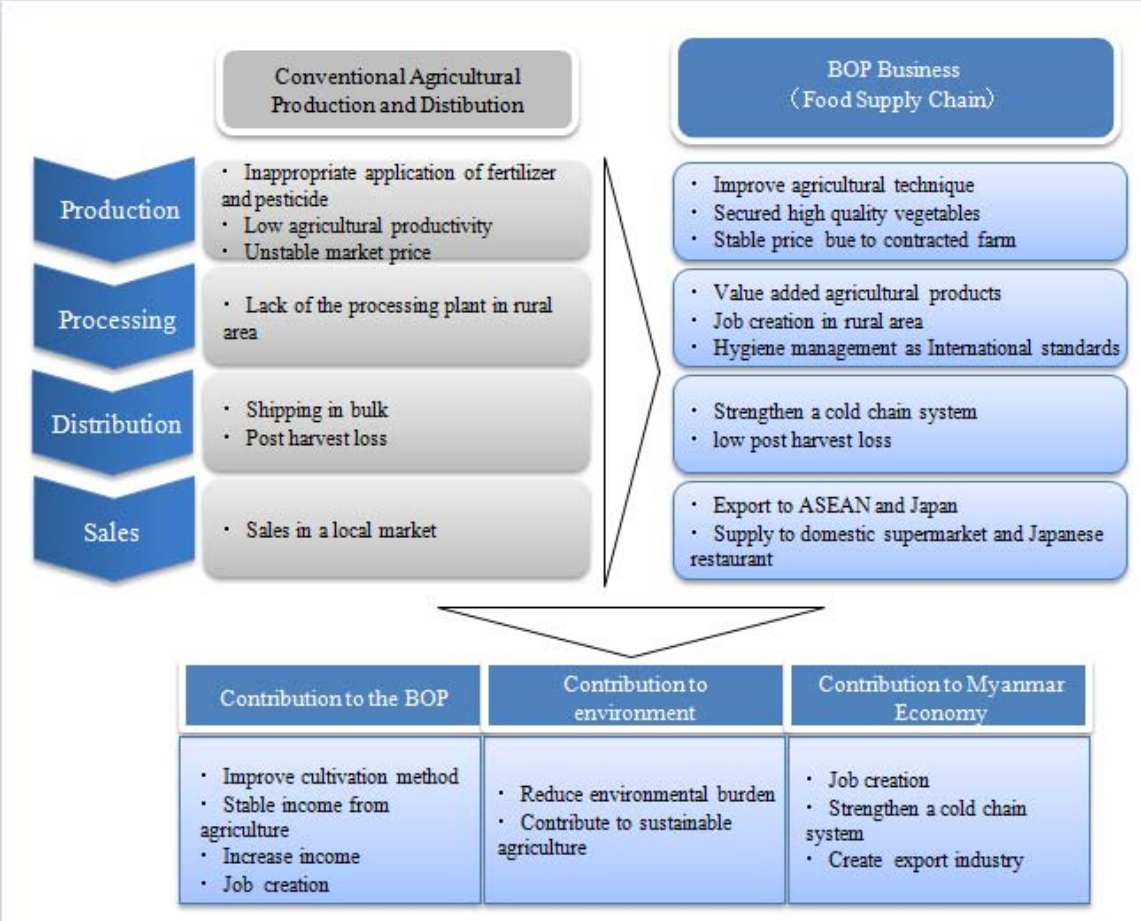


Figure 8-1 Meaning of BOP Business

Partner companies in Myanmar and Japan, and RB will establish SPC and start the business on frozen vegetables. The business is divided into three phases. The target product for the Japanese consumers is spinach and in the future, it will be extended to the markets in Myanmar and ASEAN food service industry.

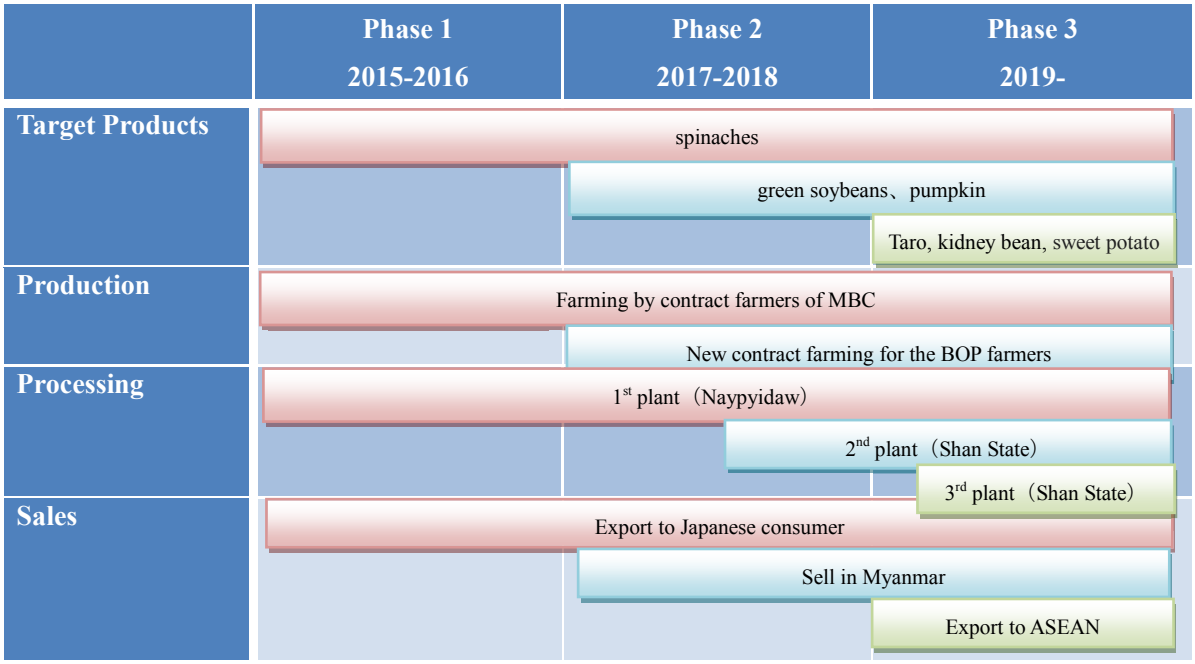


Figure 8-2 Business Outline

8.2 Target Products

The selection of products depends on the following: 1) feasibility of cultivation, 2) technical level of farmer, 3) receptivity of the Japanese market, and 4) receptivity of the Myanmar market.

According to the criteria, products are ordered by priority. Spinaches are the 1st priority; green soybeans and pumpkin are the 2nd priority; and taro, kidney beans, and sweet potato, are the 3rd priority.

8.3 Cultivation Schedule

Heho and Hopong in Shan State are selected as the cultivation sites. The reasons are: 1) good climate for cultivation because of high land area with altitude of more than 1,000 m, 2) good access to Mandalay and Naypyidaw by land and Yangon through Heho Airport, 3) there are contract farmers which the local partner company contracts with, and 4) Pao, which is one of the ethnic groups in Shan State and doing cultivation of vegetables and fruits, can be involved in the business. The cultivation plans are shown in Tables 8-1 to 8-3.

Table 8-1 Cultivation Plan for Spinaches

	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Cultivation area（ha）	62.5	125	375	750	1,125
Cultivation group	1	1	2	4	6
Contract farmer	30	60	180	360	560
Production（MT）	500	1,000	3,000	6,000	9,000
Sales（USD 1,000）	175	350	1,050	2,100	3,150

Calculation basis: Sale price: USD 1.4/kg; Purchase price: USD 0.35/kg; Yield: 8.0 t/ha

Table 8-2 Cultivation Plan for Green Soybeans

	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Cultivation area （ha）			330	1,000	1,670
Cultivation group			2	5	9
Contract farmer			165	500	835
Production （MT）			1,000	3,000	5,000
Sales （USD 1,000）			500	1,500	2,500

Calculation basis: Sale price: USD 2.0/kg; Purchase price: USD 0.50/kg; Yield: 3.0 t/ha

Table 8-3 Cultivation Plan for Pumpkin

	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Cultivation area （ha）			130	400	670
Cultivation group			1	2	4
Contract farmer			65	200	335
Production （MT）			1,000	3,000	5,000
Sales （USD 1,000）			180	540	900

Calculation basis: Sale price: USD 0.75/kg; Purchase price: USD 0.18/kg; Yield: 7.5 t/ha

8.4 Processing Plan

The 1st plant is constructed in Naypyidaw because of 1) improved infrastructure such as electricity and water, 2) stable supply of electricity, i.e., close to substation, and 3) transportation by land. By 2018, the electricity will be improved in Heho area. Therefore, 2nd and 3rd plants will be constructed in this same area.

8.5 Distribution Plan

The expected supply chain is shown in Figure 8-3.

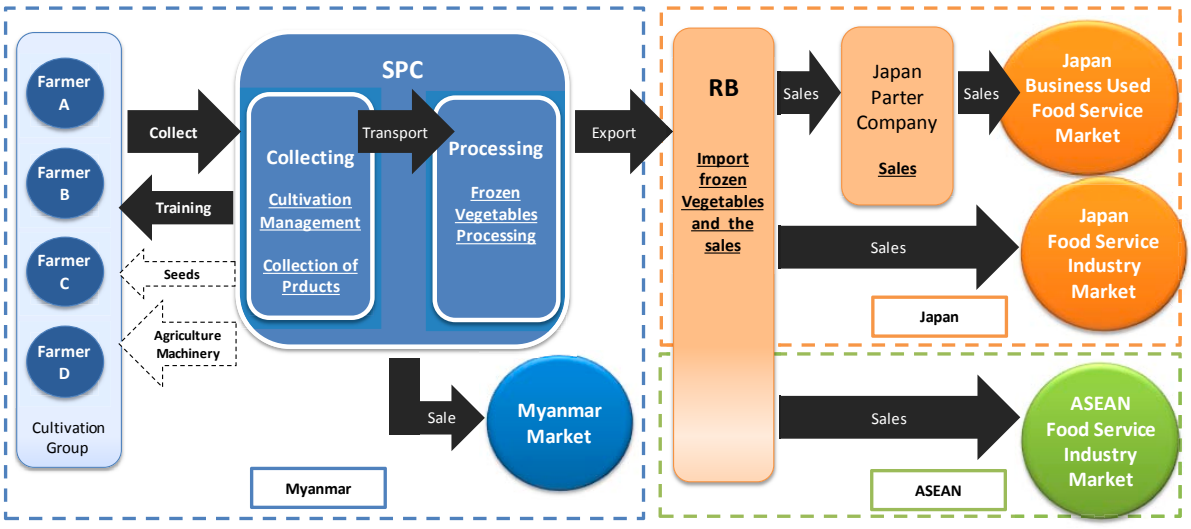


Figure 8-3 Food Supply Chain Structure

Agricultural products are transported by land from Heho, which is the collection base. After Phase 2, it will be possible to transport products in a short time and manage their quality due to the construction of the 2nd and 3rd plants.

Figure 8-4 Distribution Route of Agricultural Products

Processed vegetables in Naypyidaw are transported to Yangon and exported to Japan and ASEAN. Local company is responsible for shipment and sales in Myanmar while RB is responsible for customs clearance and sales in Japan and ASEAN. Residual agricultural chemicals are checked in the chemical analysis laboratory of the Ministry of Livestock, Fisheries and Rural Development in Yangon.

8.6 Sales Plan

In Phase 1, the consumers should be the existing consumers. Frozen vegetables will be exported to Japan in order to stabilize the business. After Phase 2, these will be sold to Myanmar and ASEAN.

Table 8-4 Sales Plan

	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Spinaches（MT）	250	500	1,500	3,000	4,500
Myanmar	-	-	200	300	500
Sell to ASEAN	-	-	-	300	500
Sell to Japan	250	500	1,300	2,400	3,000
Other products（MT）	-	-	1,000	3,000	5,000
Myanmar	-	-	-	300	500
Export to ASEAN	-	-	-	300	500
Export to Japan	-	-	1,000	2,400	4,000
Profits（USD 1,000）	350	1,190	3,475	8,325	13,175
Selling cost（USD 1,000）	175	350	1,730	4,140	6,550

8.7 Manpower Plan and Training Plan

Table 8-5 Manpower Plan

	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Japanese staff	5	5	8	8	8
Resident	2	2	3	3	3
Travel	3	3	5	5	5
Local staff	53	105	310	620	925
Management, assistant	1	3	4	5	5
Technical expert	1	1	2	5	5
Employee in plant	50	100	300	600	900
Field staff	1	1	4	10	15
(Contract Farmer)	*30*	*60*	*405*	*1,060*	*1,680*

Local staff in the plant should be: 1) a graduate from local agricultural school and 2) family of contract farmer (including candidate). This staff is expected to recognize the importance of secured vegetables because of the strict hygiene management and quality standards in the plant. Also, it is expected to feedback this recognition to the family, leading to the production of high quality products through appropriate pesticide application.

8.8 Survey and Business Schedule

Currently, the acquisitions of investment license and cultivation sites for SPC business are being undertaken, as shown in Table 8-6.

Table 8-6 Survey and Business Schedule

	Survey	Phase 1		Phase 2		Phase 3
	2014	2015	2016	2017	2018	**2019**
1. BOP survey						
2. Investment license						
3. Cultivation site						
4. Establishment of SPC						
5. Financing						
6. Vegetable production						
7. Building of processing plant						
8. Processing and sales						

8.9 Financial Analysis

Table 8-7 Profit and Loss

Unit : USD 1,000

Breakdown	Phase 1		Phase 2		Phase 3
	2015	2016	2017	2018	2019
Income					
Sales	350	1,190	3,475	8,325	13,175
Expense					
Purchase cost	175	350	1,730	4,140	6,550
Labor cost	330	520	1,220	2,380	3,380
Japanese	120	120	120	180	180
Local staff	60	100	200	400	500
Plant worker	150	300	900	1,800	2,700
Plant cost	35	119	347	832	1,317
Other cost	17	60	173	416	658
Total cost	557	1,049	3,470	7,768	11,905
Profit					
Operating profit	▲207	141	5	557	1,270

All products will be exported to Japan in the first and second years. Also, profit in a single fiscal year will be made in the second year. In 2017, investment for the 2nd and 3rd plants will be decided and after a year, the construction will be implemented. Also, the products will be extended to the domestic markets in the third year and to ASEAN in the fourth year.

8.10 Financing Plan

The SPC funding will be USD 500,000 under joint investment among Myanmar, Japanese partner companies, and RB.

8.11 Risk Analysis

The expected risks and strategies for risk reduction are shown in Table 8-8.

Table 8-8 Expected Risks and Risk Reduction

Expected Risks	Risk Reduction
① Risks in Production	
Lack of new BOP farmers, leading to insufficient amount of products	➢ List up the expected new farmers and conduct a workshop with farmers to make them understand the business by discussing contract cultivation. ➢ Improve the strategy every year. ➢ Improve the contract condition every year in order to raise the incentives for the BOP.
Unexpected climate, leading to insufficient amount of products	➢ There is no climate index insurance system in Myanmar so it is better to develop a system that will help farmers who experience damages due to climate by reserving a part of the farmer's sales.
Low quality of products and inability to meet the standards for exporting to Japan	➢ Distribute manual of fertilizer and pesticide application method, rounding by field staff and recording the cultivation. ➢ Cooperation with agricultural school and agricultural experimental station to improve the quality of products and training to farmers.
Strong competitiveness, leading to failure to reach enough planted amount due to higher price and changing the products	➢ Recommend to cultivate using crop rotation of spinaches, pumpkin, and green soybeans and provide stable income through purchase throughout the year. ➢ Cultivation training to farmers. ➢ Stable purchase guaranteed under the contract and providing seeds and fertilizer in advance, leading to reduction of the burden to farmers.
Flexible international market price, leading to pressures in the family income	➢ Recommend to diversify the risk by cultivation of variety of products. ➢ Purchase at the contract price.

Expected Risks	Risk Reduction
② Risks in Processing	
Water and electricity cut, leading to reduction of the operation rate.	➢ Water used in the plant is safe in terms of quality. ➢ In Naypyidaw, plant should have own generator in case of sudden power cut. In Heho, keep discussing with the ministry to supply electricity by next fiscal year.
Lack of able manager and technical expert, leading to inefficient plant operation	➢ The criteria for selection of employee is decided with local partner company through the Chamber of Commerce and Industry. ➢ Employee in the plant to be selected should be a graduate of agricultural school and contract farmer.
Low level of processing technique, leading to low quality of the products	➢ Employees are trained with the technique in the Japanese partner company. ➢ The Japanese technical experts visit the plant and check the lines.
③ Risks in Distribution	
Damages during the transportation, leading to high rejection rate	➢ Reduce the time loss by harvesting according to collection time. ➢ Establish a system in which products are collected at a fixed time by setting up a collection point. ➢ Use crate to prevent product damage among products.
High transportation cost due to the road situation	➢ Change the transport route according to the road condition and change truck to bigger one. ➢ The minority ethnic group should start cultivating pumpkin or sweet potato which can maintain freshness even under bad road condition..
④ Risk in Sales	
Low demand for the target products	➢ Pay more attention to the advancement of the Japanese and ASEAN companies to Myanmar and find a new demand in the food service industry. ➢ Consumer needs a variety of products rather than large amounts of products.
Competitiveness of sales contracts due to new competing companies	➢ Strengthen the relationship with the Japanese restaurant chain. ➢ Raise the name value and branding of the spinaches and green soybeans of Myanmar through stable supply.

Chapter9 Development Effects

9.1 Beneficiaries

The beneficiaries of the BOP business are shown in Figure 9-1.

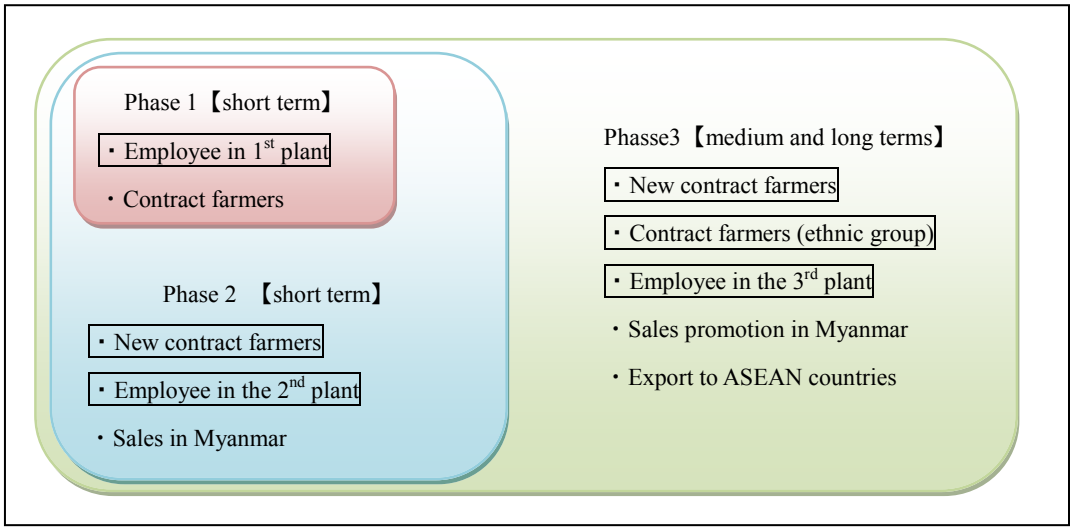


Figure 9-1 Image of Extending the Beneficiaries

The relationship between BOP and business is shown in Table 9-1.

Table 9-1 Relationship between BOP and Business

BOP	Relation to the BOP Business	Target Area
Landless farmer and women	Employee in the plant	Naypyidaw, Heho
Small-scale farmer	New contract farmers	Heho, Aungban
Ethnic group (Pao)	New contract farmers (ethnic group)	Hopong

9.2 Issues in the BOP

9.2.1 Landless Farmer and Women

The landless farmer, accounting for 30~50%, is an issue in the rural area. Also, women have cheaper income than men and they have limited job opportunity. Therefore, many women work outside the village in spite of the low income and job opportunity, leading to unstable income.

9.2.2 Small-scale Farmer

In Aungban and Heho, the small-scale farmer has unstable income because of the flexible market price. Also, there is no extension worker so farmers apply pesticide based on their accumulated experience.

Interview with small-scale farmer

Planted cabbage seedlings

（too much fertilizer and pesticide application）

9.2.3 Farmer in Ethnic Group

There are many Pao people in Hopong. Their agriculture depends on rainwater without irrigation system and water supply from the river. Pesticide is often imported from Thailand and China but they use it through their accumulated application method. Therefore, the amount of application is not appropriate. Furthermore, the road condition is a concern.

Unimproved road in Hopong

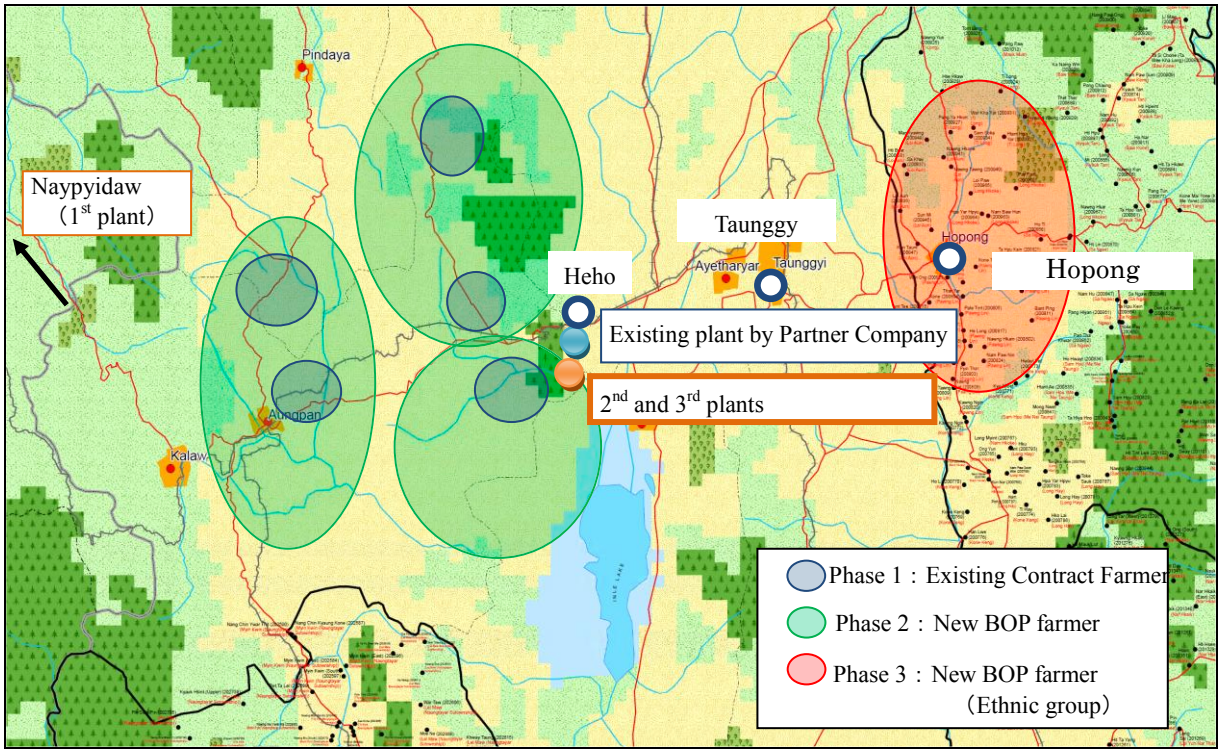
Unimproved access road to farm

9.3 Scenario to Resolve the Issues

The BOP business can solve the above identified issues as shown in Table 9-2.

Table 9-2 Issues and Solution

BOP Group	Issues	Solution
Landless farmer and women	Unstable income Lack of job opportunity in rural area	Employ in the plants (provide job opportunity)
Small-scale farmer	Unstable income due to lack of market price information Limited access to agricultural techniques Low income due to small farm	New contract farmer (stable price and training)
Farmer in ethnic group	Unstable income due to lack of market price information Unimproved road infrastructure	New contract farmer (stable price and training)



Source: Pa-O Self-Administered Zone, Myanmar Information Management Unit, UNDP, 2011.

Figure 9-2 Contract Farmers in Heho and Hopong

9.4 Indexes and Goals for Development Issues

The goals are divided by short-term index (five years after business initiation) and medium-/long- term index (5 to 10 years after business initiation).

Table 9-3 Indexes and Goals for Development Issues (Short Term)

Short Term (5 years after business initiation)	
Index 1-1: Production of secured vegetables that meet the shipping standards to Japan	Goal 1-1: 500 new contract farmer produce the secured vegetables
Index 1-2: Satisfaction of income from agriculture	Goal 1-2: 80% of the contract farmers feel the increase
Index 1-3: Extend the cultivation area for secured vegetables	Goal 1-3: Increase by more than 100 ha
Index 1-4: Increase job opportunity in rural area	Goal 1-4: 600 staffs in total are employed in the 1st and 2nd plants

Table 9-4 Index and Goal for Development Issues（Medium to Long Term）

Medium - Long Term (5 to 10 years after business initiation)	
Index 2-1: Production rate of secured vegetables that meet the shipping standards to Japan	Goal 2-1: 1,000 contract farmers produce the secured vegetables
Index 2-2: Increase the number of contract farmers in the ethnic group	Goal 2-2: 100 contract farmers produce the secured vegetables
Index 2-3: Extend the cultivation area for secured vegetables	Goal 2-3: Increase by more than 1,000 ha
Index 2-4: Increase job opportunity in rural area	Goal 2-4: 900 staffs in total are employed in the 1st , 2nd , and 3rd plants

Chapter10 Cooperation with JICA Projects

10.1 Cooperation with JICA Projects

The cooperation with existing and new JICA projects is discussed in Tables 10-1 and 10-2.

Table 10-1 Cooperation with Existing JICA Projects

Project	Scheme	How to Cooperate and the Effects
(1) The Project for Improvement of Equipment for Human Resource Development in Agriculture	Grant	This project will provide training and equipment so that human resource development organization, mainly Yezin Agricultural University, can train effectively and appropriately. In the BOP business, extension of agricultural technique to farmers is important for secured vegetable production. If training materials in the BOP business are used in the JICA project, synergistic effects will be gained.
(2) Two-Step Loan Project for Small-Medium Sized Enterprises Development and Agriculture and Rural Development	Yen Loan	This project will develop the economy and improve living standards through the development of the financial sector and rural development by providing two-step loan for SMEs. This BOP business expects to reduce the financing burden. Moreover, the two-step loan can increase farmer's income because local leasing company and farmer can purchase agricultural machinery and materials for agriculture. This project is still under the survey stage. Therefore, the target, loan condition, and implementation structure are not yet certain.

Table 10-2 Cooperation with New JICA Projects

Project	Scheme	How to Cooperate and the Effects
(3) Ethnic Group Area Development Project PAO Self-Administered Zone Development Project	Yen Loan, Technical Cooperation	Ethnic group area lacks infrastructure such as water, road, and electricity because of the last conflict between the military government and ethnic group. Therefore, it is required to support them in terms of infrastructure including education. Through the interview with the Ministry of Commerce, Chamber of Commerce and Industry, and a leader of Pa-O Self-Administered Zone, support for the ethnic group has been requested; however, it is difficult to develop infrastructure in the BOP business only. Hopong is a pilot site and has implemented the improvement of infrastructures such as road, electricity, and water, as well as rural development. At the same time, the project improves the living standards through the improvement of agricultural productivity by reduction of post-harvest loss and extension of techniques. It is expected to formulate a support program for the Japanese company which hopes to advance to the ethnic group area in Myanmar by making a report of this technical cooperation project. This will contribute to raising their income and formulation of yen loan or PPP project.
(4) The Extension of Production Technique for Upland Crops	Technical Cooperation	Agricultural products exported to Japan in the BOP business should have traceability for the Japanese food service industry. Therefore, data, such as appropriate fertilizer and pesticide application and soil analysis, have to be provided. However, the amount of fertilizer and pesticide application depends on the farmers' accumulated experience or decision of the agent. Therefore, farmer lacks the necessary knowledge. The suggested counterparts are the Yezin Agricultural University and the Department of Agriculture in Shan State. This project will formulate the extension program based on the data of appropriate fertilizer and pesticide application collected from the analysis equipment supplied to the counterparts. The extension program can be used by the department and farm leaders.