

CHAPTER IV Japanese food market as target of export

IV.1 Market size by category

IV.1.1 Grains, Vegetables & Beans, Fruits & Nuts, Meats and Seafood as the Five Categories

The Study Team cut the food market of Japan into five categories such as grains, vegetables & beans, fruits & nuts, meats and seafood, and figure out its market size. Data sources are Annual Agricultural Gross Production by Ministry of Agriculture, Forestry and Fishery for Value of Production; and Summary of Trade Statistics by Category by JETRO Agro Trade Handbook 2011 for Value of Import. The data are for the year of 2010.

According to the data, the market size of Japan's agricultural products is approximately 132 billion USD. The category of vegetables & beans is the biggest with about 36 billion USD and the category of fruits & nuts is the smallest with 13 billion USD.

For import, the total value in 2010 is approximately 37 billion USD of which share against the market is about 28%. The biggest category is meat with about 11 billion USD, and then seafood, vegetables & nuts, grains and the smallest is fruits & nuts with 4 billion USD. "Component Ratio" mentioned in the following table shows the ratio against the total value of each category.

Table IV-1 Market Size of agricultural product of Japan in 2010

(in thousands of USD)

	Annual Agricultural Gross Production		Summary of Trade Statistics by Category		Total
	Value of Production	Component Ratio	Value of Import	Component Ratio	
Grains	20,106,250	71.8	7,880,473	28.2	27,986,723
Vegetables & Beans	31,468,750	88.6	4,038,793	11.4	35,507,543
Fruits & Nuts	9,371,250	70.1	4,001,613	29.9	13,372,863
Meats	16,078,750	59.4	10,984,550	40.6	27,063,300
Seafood	18,532,500	65.7	9,687,205	34.3	28,219,705
Total	95,557,500	72.3	36,592,634	27.7	132,150,134

Source : Annual Agricultural Gross Production by Ministry of Agriculture, Forestry and Fishery for Value of Production

Summary of Trade Statistics by Category by JETRO Agro Trade Handbook 2011 for Value of Import

Exchange rate: \$1=Yen80.00

Import market shall be studied more closely by item, value and country in accordance with top 20 import items in 2010, then the target category and competitive edge of Timor-Leste. A table shown below is top 20 import items of Japan in 2010 issued by Ministry of Agriculture, Forestry and Fishery of Japan.

Table IV-2 Top 20 import items of Japan in 2010

#	Items	Yr. of 2008	2009	2010	
		Value in Thousand of US\$			Previous Yr.(%)
1	Swine Meat	5,388,501	4,604,994	4,936,502	7.2
2	Tobacco	4,628,669	4,587,008	4,342,785	-5.3
3	Corn/Maize	7,219,664	4,396,652	4,329,666	-1.5
4	Lumber Sawing Material	3,402,441	2,461,083	2,820,695	14.6
5	Fresh/Dried Fruit	2,968,760	2,843,613	2,784,473	-2.1
6	Wood Chip	3,798,796	2,474,401	2,742,355	10.8
7	Natural Rubber Latex	3,099,027	1,371,209	2,652,032	93.4
8	Beef	2,781,043	2,330,865	2,508,196	7.6
9	Prawn(Live, Fresh, Chilled & Frozen)	2,468,918	2,150,091	2,265,745	5.4
10	Alcohol Beverage	2,700,553	2,111,495	2,195,416	4.0
11	Katsuo and Tuna	2,693,069	2,335,185	2,151,951	-7.8
12	Soy Bean	3,059,545	2,041,432	2,007,270	-1.7
13	Wheat	4,241,711	1,688,416	1,824,942	8.1
14	Salmon	1,646,641	1,674,100	1,804,802	7.8
15	Processed Chicken Meat	1,697,349	1,612,403	1,732,958	7.5
16	Chipboard	2,046,538	1,345,745	1,552,927	15.4
17	Coffee Bean	1,528,546	1,263,170	1,454,378	15.1
18	Frozen Vegetables	1,394,061	1,312,330	1,400,479	6.7
19	Cole Seed for Oil	2,031,816	1,103,266	1,273,854	15.5
20	Chicken Meat	1,682,059	963,963	1,195,430	24.0
Top 20 Total (A)		60,477,700	44,671,425	47,976,863	7.4
Total Agricultural Products (B)		108,851,888	83,326,513	88,992,300	6.8
A / B (%)		55.6	53.6	53.9	

Source: Statistics data of Ministry of Agriculture, Forestry and Fishery (Conversion rate : USD 1= JPY 80.0)

IV.1.2 Import country and market share of grains

Taking a look on grain related items in top 20 import items of Japan in 2010, following are the items of grain imported.

Table IV-3 Import value of grain

#	Items	Yr. of 2008	2009	2010	Previous Yr.(%)
		Value in Thousand of US\$			
3	Corn/Maize	7,219,664	4,396,652	4,329,666	-1.5
13	Wheat	4,241,711	1,688,416	1,824,942	8.1
17	Coffee Bean	1,528,546	1,263,170	1,454,378	15.1

Following tables are import countries by item of grain.

Items shown by the tables are representing items of grain and the data source is JETRO Trade Statistics, and converted into USD at a rate of 80 JPN.

Table IV-4 Corn/Maize not for seeding (in thousands of USD)

Import Country	2009	2010	Share
Total	4,381,683	4,312,253	100.0
U.S.A.	4,234,682	3,845,555	89.2
Brazil	12,252	166,815	3.9
Argentina	53,791	228,758	5.3
South Africa	0	4,252	0.1

Table IV-5 Durum Wheat (in thousands of USD)

Import Country	2009	2010	Share
Total	95,847	58,958	100.0
Canada	95,558	58,445	99.1
U.S.A.	251	376	0.6
Turkey	28	79	0.1
Italy	10	3	0.0

Table IV-6 Coffee (in thousands of USD)

Import Country	2009	2010	Share
Total	1,258,625	1,448,477	100.0
Brazil	342,190	408,400	28.2
Colombia	295,877	384,725	26.6
Guatemala	128,333	150,035	10.4
Indonesia	122,811	134,339	9.3
Vietnam	112,618	97,531	6.7

IV.1.3 Import country and market share of vegetables & beans

Taking a look on vegetables & beans related items in top 20 import items of Japan in 2010, following are the items of grain imported.

Table IV-7 Import value of vegetables & beans

#	Items	Yr. of 2008	2009	2010	Previous
		Value in Thousand of US\$			
12	Soy Bean	3,059,545	2,041,432	2,007,270	-1.7
18	Frozen Vegetables	1,394,061	1,312,330	1,400,479	6.7
19	Cole Seed for Oil	2,031,816	1,103,266	1,273,854	15.5

Frozen vegetables are listed in top 20 items as vegetables which is processed and frozen in the produced country or area.

Fresh, frozen and dried vegetables are listed in top 40 items in JETRO Agrottrade Handbook 2011, in consideration of Timor-Leste's current facilities it is not available to produce frozen or dried; it is realistic to take a look on fresh vegetables.

Table IV-8 Import value of soy bean (in thousands of USD)

Import Country	2009	2010	Share
Total	41,738	43,188	100.0
U.S.A.	30,150	30,825	71.4
Brazil	7,125	7,100	16.4
Canada	4,413	4,625	10.7
China	638	588	1.4
Paraguay	7	25	0.1

Table IV-9 Import value of green onion (in thousands of USD)

Import Country	2009	2010	Share
Total	52,088	73,600	100.0
China	48,885	70,457	95.7
Belgium	802	387	0.5
Taiwan	501	705	1.0
Australia	774	507	0.7
New Zealand	625	771	1.0

Table IV-10 Import value of onion (in thousands of USD)

Import Country	2009	2010	Share
Total	99,657	181,315	100.0
China	82,093	118,911	65.6
U.S.A.	10,393	36,450	20.1
New Zealand	2,616	16,679	9.2
Australia	2,034	3,969	2.2
Thailand	872	4,127	2.3

Table IV-11 Import value of tomato (in thousands of USD)

Import Country	2009	2010	Share
Total	7,952	13,023	100.0
Korea	2,765	3,984	30.6
U.S.A.	2,552	3,120	24.0
Mexico	313	3,004	23.1
New Zealand	698	1,942	14.9
Canada	1,624	973	7.5

Table IV-12 Import value of eggplant (in thousands of USD)

Import Country	2009	2010	Share
Total	741	245	100.0
Korea	741	245	100.0

Table IV-13 Import value of garlic (in thousands of USD)

Import Country	2009	2010	Share
Total	25,916	44,558	100.0
China	25,182	43,842	98.4
U.S.A.	282	269	0.6
Argentina	106	87	0.2
Korea	325	198	0.4
Spain	0	107	0.2

Table IV-14 Import value of asparagus (in thousands of USD)

Import Country	2009	2010	Share
Total	5,985	6,563	100.0
Mexico	1,533	1,943	29.6
Australia	1,362	1,557	23.7
Peru	989	1,057	16.1
Thailand	1,160	974	14.8
U.S.A.	454	592	9.0
Philippines	171	128	6.6

Table IV-15 Import value of cabbage/broccoli (in thousands of USD)

Import Country	2009	2010	Share
Total	66,815	87,095	100.0
U.S.A.	60,054	74,586	85.6
China	3,599	9,512	10.9
Korea	2,288	1,854	2.1
Taiwan	816	813	0.9
Mexico	0	260	0.3

Table IV-16 Import value of yam (in thousands of USD)

Import Country	2009	2010	Share
Total	63,517	83,353	100.0
China	62,887	82,286	98.7
Vietnam	293	799	1.0
Thailand	170	186	0.2
Taiwan	17	10	0.0
Tonga	12	16	0.0

Table IV-17 Import value of carrot/turnip (in thousands of USD)

Import Country	2009	2010	Share
Total	26,468	35,004	100.0
China	18,231	27,168	77.6
New Zealand	3,492	2,978	8.5
Taiwan	1,674	1,339	3.8
Australia	2,626	3,150	9.0
U.S.A.	418	334	1.0

IV.1.4 Import country and market share of fruits & nuts

Taking a look on fruits & nuts related items in top 20 import items of Japan in 2010, following are the items of grain imported.

Table IV-18 Import value of carrot/turnip (in thousands of USD)

#	Items	Yr. of 2008	2009	2010	
		Value in Thousand of US\$			Previous Yr.(%)
5	Fresh/Dried Fruit	2,968,760	2,843,613	2,784,473	-2.1

Following are the value and share of import of banana, pineapple, mango, papaya and durian as typical item of fruit sourced from JETRO trade statistics.

Table IV-19 Import value of banana (in thousands of USD)

Import Country	2009	2010	Share
Total	1,181,048	931,028	100.0
Philippines	1,084,045	857,881	92.1
Ecuador	55,790	40,144	4.3
Taiwan	16,788	14,842	1.6
Peru	9,879	6,605	0.7
Thailand	3,223	3,066	0.3

Table IV-20 Import value of pineapple (in thousands of USD)

Import Country	2009	2010	Share
Total	129,449	122,633	100.0
Philippines	128,307	121,230	98.9
Taiwan	1,004	1,277	1.0
U.S.A.	3	28	0.0
Thailand	10	0	0.0
Sri Lanka	26	19	0.0

Table IV-21 Import value of mango (in thousands of USD)

Import Country	2009	2010	Share
Total	54,687	51,578	100.0
Mexico	19,709	16,268	31.5
Thailand	9,588	10,484	20.3
Taiwan	7,778	8,189	15.9
Philippines	11,161	10,372	20.1
Peru	0	278	0.5

Table IV-22 Import value of papaya (in thousands of USD)

Import Country	2009	2010	Share
Total	9,321	8,169	100.0
Philippines	6,609	5,891	72.1
U.S.A.	2,652	2,248	27.5
Taiwan	59	30	0.4

Table IV-23 Import value of durian (in thousands of USD)

Import Country	2009	2010	Share
Total	475	542	100
Thailand	475	542	100

IV.1.5 Import country and market share of meats

Taking a look on meat related items in top 20 import items of Japan in 2010, following are the items of meats imported. Processed chicken meat such as chicken nugget and other related products exceeded fresh or frozen chicken meat import volume after epidemic of bird flu in 2006.

Table IV-24 Import value of meats

#	Items	Yr. of 2008	2009	2010	Previous Yr.(%)
		Value in Thousand of US\$			
1	Swine Meat	5,388,501	4,604,994	4,936,502	7.2
8	Beef	2,781,043	2,330,865	2,508,196	7.6
15	Processed Chicken Meat	1,697,349	1,612,403	1,732,958	7.5
20	Chicken Meat	1,682,059	963,963	1,195,430	24.0

Following are the value and share of import of swine meat, beef and chicken sourced from JETRO trade statistics.

Table IV-25 Import value of swine meat (in thousands of USD)

Import Country	2009	2010	Share
Total	1,522,535	1,509,950	100.0
U.S.A.	1,102,714	1,088,483	72.1
Canada	347,028	356,910	23.6
Mexico	70,046	61,581	4.1
Australia	1,817	1,456	0.1
Spain	482	530	0.0

Table IV-26 Import value of beef (in thousands of USD)

Import Country	2009	2010	Share
Total	1,349,250	1,405,227	100.0
Australia	1,032,751	998,618	71.1
U.S.A.	248,361	318,657	22.7
New Zealand	43,136	51,681	3.7
Canada	17,580	28,390	2.0
Mexico	7,421	7,880	0.6

Table IV-27 Import value of chicken (in thousands of USD)

Import Country	2009	2010	Share
Total	951,892	1,184,058	100.0
Brazil	892,177	1,087,963	91.9
U.S.A.	37,214	71,636	6.1
Philippines	17,875	18,151	1.5
Chili	1,592	4,495	0.4
Argentina	1,596	322	0.0

IV.1.6 Import country and market share of seafood

Taking a look on seafood related items in top 20 import items of Japan in 2010, following are the

items of meats imported.

Table IV-28 Import value of seafood

#	Items	Yr. of 2008	2009	2010	Previous
		Value in Thousand of US\$			
9	Prawn(Live, Fresh, Chilled & Frozen)	2,468,918	2,150,091	2,265,745	5.4
11	Katsuoonus and Tuna	2,693,069	2,335,185	2,151,951	-7.8
14	Salmon	1,646,641	1,674,100	1,804,802	7.8

Following are the value and share of import of seafood sourced from JETRO trade statistics.

Table IV-29 Import value of shrimp/prawn (in thousands of USD)

Import Country	2009	2010	Share
Total	2,025,731	2,125,853	100.0
Vietnam	423,290	447,649	21.1
Indonesia	384,009	380,302	17.9
Thailand	281,689	329,229	15.5
India	227,521	289,848	13.6
China	122,727	111,190	5.2

Table IV-30 Import value of yellow-fin tuna (in thousands of USD)

Import Country	2009	2010	Share
Total	161,750	194,483	100.0
Taiwan	52,680	72,945	37.5
Korea	32,169	33,459	17.2
China	28,876	26,318	13.5
Philippines	10,922	10,995	5.7
Vanuatu	6,040	13,199	6.8

Table IV-31 Import value of big-eye tuna (in thousands of USD)

Import Country	2009	2010	Share
Total	161,750	194,483	100.0
Taiwan	52,680	72,945	37.5
Korea	32,169	33,459	17.2
China	28,876	26,318	13.5
Philippines	10,922	10,995	5.7
Vanuatu	6,040	13,199	6.8

Table IV-32 Import value of Pacific and Atlantic salmon (in thousands of USD)

Import Country	2009	2010	Share
Total	187,476	201,881	100.0
Norway	160,415	173,177	85.8
Australia	11,236	13,551	6.7
New Zealand	5,530	7,331	3.6
United Kingdom	3,800	3,579	1.8
Canada	6,071	3,724	1.8

IV.1.7 Target categories and potentiality of export

The current agricultural product exporting to Japan is only coffee beans which are ranked number 2 in value wise of items exporting to Japan with 200 millions of yen by JETRO 2011 statistics. Some Japanese NGO started importing coffee bean from Timor-Leste. Its coffee beans are popular with good taste called forest coffee.

With regards to the coffee, Peace Winds Japan, a NGO and Alter Trade Japan, Inc. have started coffee exporting to Japan with providing cultivation training to the farmers in Timor-Leste, and Timor Global LDA and CCT has been in coffee business exporting the products to developed countries such as Europe or United States. The coffee business has been started by private sectors and they take care from production, processing and exporting.

Considering those facts, coffee beans are already handled by private sectors, and it would be better for the Study Team to exclude coffee beans from the list of study as possibilities of exporting agricultural products of Timor-Leste.

Regarding grains, there is an oligopoly situation in the market by South and North American countries such as U.S.A., Canada and Brazil. This situation is caused by their large land and mechanized farming, and it is not applicable to Timor-Leste with its small and steep land. Therefore, Timor-Leste does not have advantages to the grains.

There are no data available for Timor-Leste of its exporting agricultural products other than coffee, so the consideration can be carried out by looking at neighbor countries such as Indonesia, Thailand, Philippines and Viet Nam.

Items importing to Japan from these countries, onions, asparagus and yams are listed in higher ranking so it will be required to investigate more on these products to be produced in Timor-Leste in terms of climate, soil and other related conditions to production.

It is also necessary to take a close look on banana, pineapple, mango and papaya as tropical fruits. Import values of these fruits are not so big, but these products would not require expensive equipments or facilities like frozen processing and these products can be fit for Timor-Leste by cultivar improvements. There is a regulation on disease and pest for fruits in Japan for import, and it is required to secure traceability records and meet in the regulation. It is necessary to equip refrigerated facilities and to procure packing materials. In consideration of such conditions required for fresh tropical fruits, exporting those products are not realistic at this moment. It would be better for the

Study Team to investigate possibilities of dried or preserved in syrup.

Chicken meat is imported to Japan with bone-less frozen condition. In addition to big bird farm, bone-less processing facility and freezing storage shall be required, and these processing techniques shall be also required. Imported value of processed chicken meat is bigger than fresh or frozen chicken meat, and additional facility processing like nuggets will also be required to establish competitive advantages.

In terms of seafood, shrimp/prawn, yellow-fin tuna and big-eye tuna are listed in higher place as import from neighbor countries of Timor-Leste. But these products again required big farms, processing facilities and freezing storage as well as processing and storage techniques.

In consideration of additional facilities and techniques required to meats and seafood export to Japan, the Study Team has a strong impression that meats and seafood are not the possible products of Timor-Leste to export to Japan at this moment.

IV.2 Sale channel candidate in Japan

There are three major channels of imported agricultural products in Japan; (1) Food retailers, (2) Food processing makers, (3) food service companies. For sales to these channels, it is available to use exhibitions or contact companies directly.

The situation of the major channels in Japan and the concrete company names are as follows.

IV.2.1 Food retailers

The distribution channel of the food retailers has plural patterns by a product type or a target. About vegetables and fruits category, the product type includes "fresh vegetables and fruit" and "frozen vegetables" and the target includes "Consumers" "Business use", and "Processing use".

A) Fresh vegetables and fruit

As for the circulation of fresh vegetables and fruits, it is common to distribute from import companies to wholesale markets, to wholesalers, to retailers, and finally consumers.

Examinations of quarantine inspection are necessary for the import of food, so that import companies should be chosen for transporting crops to inside of Japan. Once the crops are imported in Japan, whole sale markets play a big role in the distribution system.

In Japan, consumer behavior is known as "High frequency at nearest"; this is why so many small or medium sized grocery retailers exist all over the country. Whole sale markets have a function of collecting a big amount of crops from farmers and then sharing many small sized various crops. Japan has 77 major whole markets in big cities and other local whole markets which both are based on the whole market low. The price of crops are made by bidding block system, because quality by the freshness is easy to change and supply amount moves by weather, so that it is hard to keep same prices. Bidding block system solves this type of problem.

However, diversification of the consumption types and acceleration of distribution are requested by buyers, negotiation transaction is increasing. Negotiation transaction means a seller and a buyer agree price beforehand and this type of trade are seemed to be bigger and bigger.

The trade through whole markets has benefit as follows; (1) No need to find out concrete buyers, (2) No leftover goods. These features make temporary spot trade of import crops easier. The sales are settled within three days.

Also, through the wholesale market, a wholesaler which is licensed by Ministry of Agriculture, Forestry and Fisheries of Japan should be selected and would be entrusted for the crops.

In case of the Tokyo Central Whole Market, one of 77 major whole markets in big cities, registered wholesalers are 9 companies in fresh vegetable and fruits section, 1 company in fresh meat section and 9 companies in fresh fish section. Tokyo City Seika Co., Ltd. and Tokyo Seika Co., Ltd. are listed on the fresh vegetable and fruits section.

The Wholesale Market Law was revised in June 2004, it became possible that big wholesalers directly sell to retailers or consumers, or retailers directly buy from producers. These things means some part of multi-stage distribution can be omitted so that wholesalers are good candidate of distributors because once big wholesaler can treat a crop, they might sell to food retailers and food service companies, too.

However, the distribution ratio of fresh vegetable through wholesale market is getting decreasing. The other route comes directly from farmers which are out of wholesale trade.

The ratio of wholesale trade was 82.7% in 2003, but it went down 64.6% in 2006. In imported vegetables, it is seemed that only half of them go through wholesale markets.

The route directly from farmers; out of wholesale market route, is used by big supermarket chains, consumers' cooperatives, trading companies and food service companies.

For food service companies, it is necessary to secure stable supply throughout the year, professional companies arrange the suppliers of items in season, and manage both channels of contract farming and wholesale markets.

Domestic vegetable for retailers go through wholesale market and for food processing companies go directly from farmers. Imported vegetables for retailers are also dealt with wholesale market, but for food processing companies are dealt with imported companies.

B) Frozen vegetables

Frozen vegetables frozen vegetables are given pretreatment such as peeling, cutting and blanching and refrigerated rapidly to become less than minus 18 degrees Celsius. These frozen vegetables are processed like uncooked, blanched, and cooked with sugar or oils. Japan import many frozen vegetables and the ratio to the import materials are pretty high.

Frozen foods are not treated in wholesale market. The basic distribution channels begin from importation by trading companies, then brokerage companies, and finally go to retailers or business users. Other types of distribution such as direct merchant from abroad are seen and middlemen are

sometime skipped. The repackage in domestic are done rarely, and most of all products are packed for end users and imported.

There are other distribution channels for marine products. About spices, food retailers do not buy directly from supply countries, but trading companies deal with. It is described in other part.

IV.2.2 Food processing makers

There are various type of food processing makers depending on foodstuff such as agricultural products, livestock products and marine products. Among these products, the Japanese food processing makers have overseas factories in China or Thailand where personnel expenses are low and procure cheaper. The makers precede high value products which are too expensive to precede in domestic, for example, handmade rolled cabbage, yakitori (chicken) grilled over coals and meat of fish pulled out bones by hand. The makers try to improve the profit by producing it abroad.

In the frozen food industry, domestic products, cooked foods and foodstuff for business use, decreased from 1,080,000 tons of 1997 at the peak and became 988,000 tons in 2005. This means substitution from a domestic product by import goods and market itself is not smaller. On the other hand, consumer market is getting bigger.

For food proceeding companies, even if a problem occurs by cause of the suppliers or manufacturing subcontractors, a maker must be accused. And customize for Japanese consumers or business use is requested by buyers, it is essential to build up all system such as; procurement, production process, quality and sanitary controls for Japanese market. This is why many major company select only a few companies that can be managed and strengthen operation of farmland and the traceability system. Moreover, some of companies invest abroad directly and have affiliated companies to import their products. The cooked frozen food industry faces safety issues with cost reduction.

The major company of frozen foods for consumers is TableMark Co., Ltd., Nichirei Corporation, Maruha Nichiro Foods, inc., Ajinomoto Frozen Foods Co., Inc. and Nippon Suisan Kaisha, Ltd. These five companies occupy approximately 70% of the market. The food industry for business use includes Kyokuyo Co., Ltd. and Yayoi Foods Co., Ltd. The special item such as the egg product is Kewpie cooperation's fields and the share of Nissin Foods is high with the pasta category.

Spices are imported mainly by spice trading companies and some by general trading companies. A part of spice makers or food processing makers go to supply countries and procure by them, but documentation on traceability makes them bother. So, almost all spices import through trading companies. The volume of imported spices are used for: about 50% as food processing industry, about 20% as food service industry, about 15% as for consumers and about 10% as trading between spice industry. In the spice market for consumer, S&B Foods Inc. has top share, about 60%, and House Foods Corporation has next place, about 30%. (Source of statistics: Japan ASEAN center, Marketing Guide for Exportation (Food Industry) March 2007)

IV.2.3 Restaurants and home-meal replacement industries

The food service market size in 2009 is about 300,000 million USD and by 2.7% decrease from 2007. The restaurant business is the biggest market with 158,000 million USD just as same as 2007. Home-meal replacement has 76,000 million USD, and by 2.1% decrease from 2007. Total food service and home-meal replacement industries are 375,000 million USD in 2009 and by 2.6% decrease from 2007.

The market size of restaurants and home-meal replacement industries are gradually decreased from 2007 to 2009. National supermarket stores, regional supermarket stores and convenience stores, however, are active in daily prepared foods, and also national restaurant chain stores started food delivery service to single household seniors and people who have difficulty to go shopping. Business opportunities for the services to those people are increasing in Japan.

Considering that the food service industry has approximately 300,000 million USD and import value have been moved steadily, and there are increasing concerns for food safety due to the bird flu and BSE (Bovine Spongiform Encephalopathy) issues, the potential demand for Timor-Leste agricultural product which is grown by organic or without use of pesticides.

Table IV-33 Market size of food service industry of Japan(in millions of USD)

	2007	2008	2009
Regular Restaurants	112,676	113,500	111,063
Noodle Restaurants	13,543	13,400	13,361
Sushi Restaurants	17,145	17,091	16,926
Other Restaurants	16,024	16,553	16,808
Restaurant Total	159,388	160,544	158,158
Domestic Airline Foods	3,143	3,095	2,795
Accommodation Facilities	38,889	38,321	36,926
Commercial Food Supply	201,419	201,960	197,879
School	6,016	6,121	6,260
Canteens	15,761	15,431	14,788
Lunch Box Supply	6,985	6,830	6,470
Business Offices	22,746	22,261	21,258
Hospitals	10,258	9,983	10,025
Day-care Center	3,366	3,374	3,509
Facility Food Supply	42,386	41,739	41,051
Food Supply Total	243,805	243,699	238,930
Coffee Shops	13,241	12,949	12,564
Bars & Beer Halls	13,290	13,256	12,734
Sub-total	26,531	26,205	25,298
Upscale Japanese Restaurants	4,429	4,320	4,150
Night Clubs	32,620	31,821	30,568
Sub-total	37,049	36,141	34,718
Food Service Total	307,385	306,045	298,945
Home-meal Replacement Food Service	77,711	75,971	76,073

Source: 2011 Food Market Almanac, Japan Food Service News Company

IV.2.4 Required conditions and competitive advantages to Timor-Leste

Required conditions to Timor-Leste from Japan would be compliance with applicable laws and regulations as the minimum ones, and also the items shall not be listed by legal restrictions and shall be adopted sanitary and phytosanitary measures. There will be additional standards need to clear such as data of traceability and eating quality for taste and texture which are set by Japanese supermarket stores or restaurants as their independent quality standards.

It is necessary for Timor-Leste to establish a total system which guarantees the quality of the products from cultivation to harvest and transportation. Fit-and-gap approach would be a suitable approach to clarify the idealistic condition and necessary actions to take in achieving the idealistic condition.

The Study Team classified food market into three segments. The first segment is an essential need for food, the second segment is an upscale need and the third one is a matured need for food.

Cost advantage achieved by large-scale production is strongly required for the first segment, and higher grade products which are achieved by long-time cultivar improvement are required for the

second segment. It would be very difficult for Timor-Leste's current resources to fulfill those needs in a short term. Regarding the third segment such as safety or healthy, it may be fulfilled by Timor-Leste utilizing and improving its current technique of agriculture.

IV.3 Sample hearing of Japanese companies

The Study Team visited several Japanese companies which might be importers or users of agricultural products of Timor-Leste, and the Study Team tried to find out their requirements on agricultural products.

IV.3.1 Food retailers

A) National supermarket chain (A company)

The company has approximately 430 stores nationwide. They import fresh vegetables, fruits and processed foods for daily prepared foods.

Regarding the quality, imported agricultural products are in compliance with "Global GAP" or "Global Food Safety Initiative (GFSI)" or other international guidelines. Organic is not a competitive advantage since its movement is already slow down in Japan and its sales are so small than it used be.

For delivery, the company is a direct importer. Within 24 hours of delivery from the country of origin to Japan's port is a critical condition and they established a system of free quarantine which is achieved by two years of record of no trouble and violation in terms of quarantine. The Study Team understands that it would be very difficult to achieve the free quarantine at importing the agricultural products.

B) Regional eminent supermarket chain (B company)

The company was founded in 1969 in Okayama prefecture, a subdivision located in west of Japan, and has 52 stores including general merchandising stores in which carry food. They import pesticide free agricultural products, fruits and commodities not available in Japan out of harvest. They buy the imported products from the neighborhood markets because even 52 stores cannot sell out the minimum quantity of the items for direct import. The volumes of import are 10% in fresh vegetables and 30% in fruits because their main customers' concern for vegetables is for domestic.

Good shape and uniformed size are required for fresh vegetables and fruits as its required quality. Demand of organic and reduced amount of pesticide products are not high, and that is why the organic certification is not necessary to have business with the company.

Price is not necessarily low because they carry imported products not competing to domestic ones.

They would like to continue introducing the new products to their customers so that they can maintain customers' repetitive visit to their stores, and the taste is the primary quality to the new products.

Even for the regional supermarket chain with its number of stores are 52, they do not import directly, the customers' interest is domestic products, and they always looking for the new products which can be a magnet to the customers and which is not necessarily domestic.

IV.3.2 Food manufacturing companies

A) Food manufacturing company (C company)

This company is one of the top food manufactures and its main products are mayonnaise, salad dressing and source. They procure the materials through general and specialized trading companies to secure the traceability information and the consistent supply, and the materials are provided ready-to-put into production lines for example crushed spice beans.

The quality requirements for the materials are to comply with the Japanese government standards, and in addition to that it is required to meet their residual pesticide, insect pests and foreign substances regulations. Price would not be a driver for their determination on selection because they think the inexpensive products have some reasons to make it cheap. Quality always comes first upon their determination of sourcing.

Regarding the products made in Timor-Leste, it is necessary to have a strong advantage or a value to choose. But at the same time it is easy to have image of quality because the county is located next to Indonesia.

B) Food manufacturing company (D company)

The company is also one of the top food manufactures and its main products are source for curry and stew, and spices. They procure the materials through general and specialized trading companies to secure the traceability information and the consistent supply.

In case of the use of imported product from Timor-Leste, their requirement for quality would be in compliance with the Japanese government standards, and the products will be required to meet additional standards which are established by each company. Regarding the traceability, they need to secure the information of seeds of the products, and they also require the products pesticide free. Quality is the first priority and the cost follows it, if they source the materials from Timor-Leste.

C) Food manufacturing company (E company)

This company is manufacturing frozen Japanese radish, frozen sweet potatoes, namul a Korean seasoned vegetables and daily prepared foods. The company imports the materials from Indonesia, China and Sri Lanka where their subsidiaries and subcontractors are growing and processing.

One of the major critical issues in overseas procurement is securing the traceability. Nobody can access to the Japanese market without it. It is very important for overseas procurement to educate farmers in order to keep records such as cultivation, fertilizations and pesticide applications. Inspection process is required for at least three months training even for Japanese, and it would be very difficult to train foreign people where level of education is different from Japan.

At importing, JAS, JIS, SPS and residual pesticide are applicable standards, and there are additional standards established by manufacturing companies regulated cultivation method, applicable pesticide, tracking and packing. All those data shall be required at import into Japan so it must be burdens for exporting countries.

It is found that the traceability is most important requirement for exporting to Japan, and general and specialized trading companies play an important role for importing.

IV.3.3 Restaurants and home-meal replacement industries

A) Fast food chain restaurant (F company)

This company operates approximately 950 stores of fast food restaurant chain and they serve beef-bowl (a bowl of rice topped with beef and onion simmered in a mildly sweet sauce.)

They use domestic fresh vegetables while they use imported rice, beef, and red pickled ginger and green onion. They import spice from subcontractor to which they provide technical guidance, they import red pickled ginger from Thailand via trading company and green onion is imported from China. SPS and traceability requirements are in line with the Japanese government standards. Organic and GAP certificates are not necessary but it is recommended just a nice to have.

Due to an intension of labor cost in China and consideration of the current Japan-China relations, they are trying to find the other sourcing countries and are trying to relief the situation too much depend on China in sourcing. They are ready to study the possibility as long as the product is provided as same price as it is from China.

IV.3.4 Importing companies

A) Specialized trading company (G company)

The company is a specialized trading company dealing with spices and nuts, and the company is in the top position in spices trading. They sell their products to other trading companies and food manufacturing companies such as curry paste and sources.

The primary requirement for the spices is uniformity in taste and flavor as well as residual pesticide, insect pests and foreign substances regulations. Organic is not a strong point for spices because the materials from the different sources are mixed up in the process of manufacturing. Japanese quality standard is over drafted, so it is easier to export to other countries than Japan.

For logistics, fuming has to be done in Timor-Leste before export and break bulk cargo is not applicable for spice transportation because of transfer of flavor. The minimum lot of 20 feet container, it will be 10 to 11 tons for clove and 15 tons for nutmeg.

IV.4 Consideration about ASEAN 4

IV.4.1 ASEAN4 countries as Competitor of exporting Agricultural products to Japan

The total sum of agriculture and forestry marine products importing into Japan reaches USD 78,744.8 million. The biggest importing country is USA, and it occupies 21% in the import total sum and China and Australia follow it.

Among these importing countries, ASEAN4 countries (Indonesia, Malaysia, The Philippines, and Thailand) would be the competitor of Timor-Leste. Then, Thailand (the 3rd place), Indonesia (the 6th place) Malaysia (the 9th place) are listed on the import country of top ten rank. (The Philippines is the 17th place)

Although industrial materials like natural rubbers are included with an import value in this statistics, there is much import of the food, and ASEAN4 countries have already targeted a Japanese market.

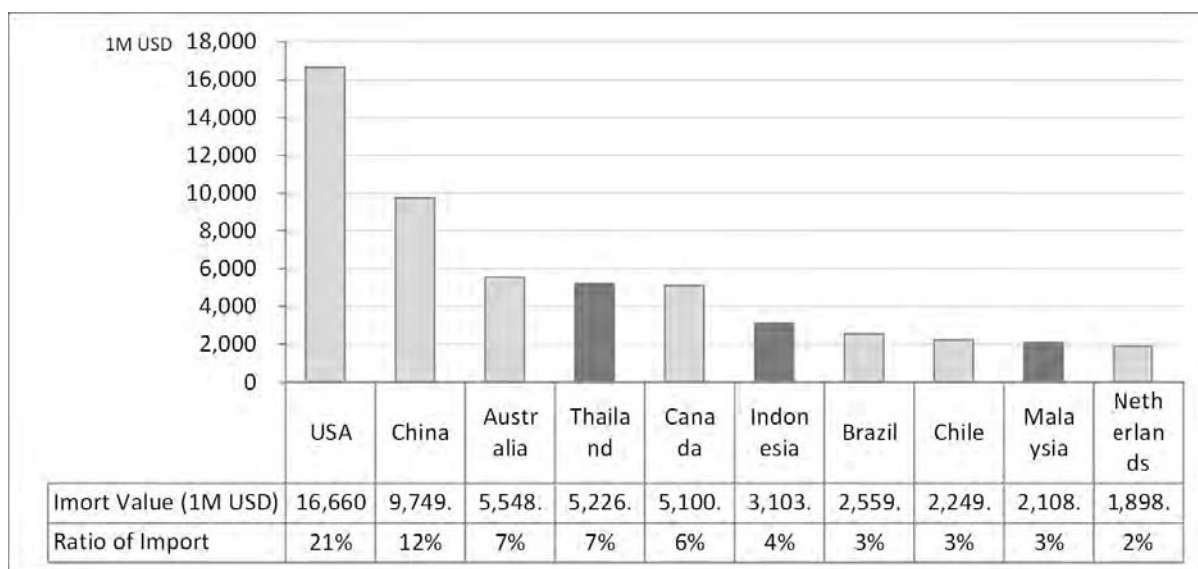


Figure IV-1 The top ten countries of agricultural, forestry & fisheries products import to Japan

*The industrial materials are included in the value

Source : JETRO Agrottrade 2011 (The statistics data are 2010)

In addition, the major food items which ASEAN4 countries exports to Japan are as follows.

Table IV-34 Top five imported items of Japan from ASEAN4 Countries in food categories

Thousand USD							
Thailand(3rd Place)		Indonesia(6th Place)		Malaysia(9th Plac)		Philippines(17th Place)	
Items Total	5,226,877	Items Total	3,103,097	Items Total	2,108,096	Items Total	1,304,142
Processed prawn /shrimp products	342,119	Shrimps and prawns	346,860	Palm oil	456,530	Banana(Fresh)	776,165
Shrimps and prawns	300,486	Coffee bean	122,506	Palm-kernel oil	97,693	Pineapple(Fresh)	110,269
Raw sugar	275,076	Big-eye tuna	82,137	Coconut butter	64,046	Coconut oil (Copra)	47,718
Starch, dextrin	185,820	Yellowfin tuna	77,645	Shrimps and prawns	53,107	Shrimps and prawns	40,801
Rice	176,642	Processed prawn /shrimp products	51,977	Papper	29,509	Big-eye tuna	21,264

Source : JETRO Agrottrade 2011 (The statistics data are 2010)

There are some common points of the higher item in each country.

At first, the higher rank items have high share among exports to Japanese market.

The second, there is the item that is available to the same channels with a similar item like "Processed prawn" and "Shrimps and prawns" or "Banana (Fresh)" and "Pineapple (Fresh)" When Timor-Leste tries to enter the Japanese market, ASEAN4 countries become Competitor. At the time, the items that have already procured from these countries would be easier, because Japanese market take diversification of supply country.

For the import to the Japanese market, the necessity documents such as "The plant inspection certificate" which an export country government office publishes by the regulation of "The plant protection law" are required. "The food hygiene law" also requires confirmation about the additives such as pesticide residue, a coloring agent and bleach. Since 2006, the Positive list of pesticides system has been applied, and the pesticides remaining behind in food are limited in 0.01ppm or less. Not only fresh vegetables, but also the frozen vegetables become a target of the inspection.

All foods and beverages for consumers need to adhere to "Japanese Agricultural Standard" which is quality indication standard and may be regulated by "Regulations of Measurement", "National Health Promotion", "Act against Unjustifiable Premiums and Misleading Representations", "Container Packing Law for the Promotion of Utilization of Recycled Resources" and "Resources Utilization Promotion Law" ASEAN4 countries support those regulations to export products to Japanese market and Timor Leste needs the same countermeasures.

IV.4.2 ASEAN4 countries for the market in future

ASEAN4 countries export agricultural products, but also import at the same time.

Compared with Japan import value as 132 billion USD, ASEAN4 countries value are still small, but three countries market size, Indonesia, Malaysia and Thailand, is as big as around 10 billion USD. Although Philippines has relatively small size market, import value is bigger than export value; then it is the net export country.

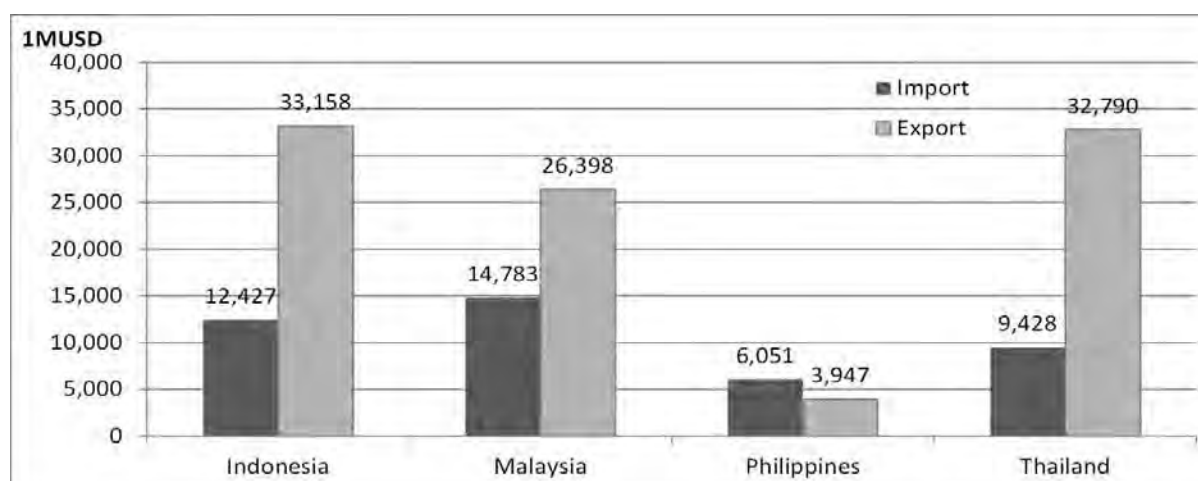


Figure IV-2 Trade value on agricultural products in ASEAN4 countries

Source :Agriculture product FAOSTAT (2010) Fisheries FAO Fish STAT(2009)

To examine importing item concretely, garlic and dry onions in Vegetable category, temperate zone fruits like apple, oranges, pear and grapes which are not produced in ASEAN4 countries are common for import. In addition, as a general tendency, items with the transportation durability, a processed items are many.

ASEAN4 countries import spices, too. Specially, chilies (dry), pepper and ginger are common items to be imported. It is interesting that ASEAN4 countries import some items which they export. This means they do not export surplus of the domestic demand, but they import consumer favorite if they cannot procure domestically.

Table IV-35 Major imported items of ASEAN4 countries

Thousand USD										
	Indonesia		Malaysia		Philippines		Thailand		Japan (for reference)	
	Items	Values	Items	Values	Items	Values	Items	Values	Items	Values
Vegetables	Garlic	245,960	Onions, dry	189,283	Paste of Tomatoes	17,453	Dried Mushrooms	48,263	Frozen vegetables	250,692
	Onions (inc. shallots), green	33,862	Garlic	132,078	Vegetables Dehydrated	8,755	Vegetables fresh nes	33,227	Dried sweet corn mixtures of vegetables	219,818
	Onions, dry	22,475	Cauliflowers and broccoli	42,884	Veg.in Tem. Preservatives	4,205	Vegetables Preserved Nes	16,388	Onion (Fresh or dried)	174,334
	Vegetables Dehydrated	17,654	Carrots and turnips	36,317	Sweet Corn Prep or Preserved	3,030	Garlic	14,067	Green pepper (Fresh or dried)	123,644
	Carrots and turnips	17,617	Cabbages and other brassicas	29,179	Canned Mushrooms	2,415	Onions, dry	13,365	Pumpkin (Fresh or dried)	98,504
Fruits	Apples	168,084	Apples	55,796	Apples	38,236	Apples	123,528	Banana (Fresh)	899,519
	Tangerines, mandarins, clem.	143,392	Fruit Prp Nes	55,308	Tangerines, mandarins, clem.	16,621	Fruit Prp Nes	90,901	Kiwi fruit (Fresh)	263,099
	Pears	87,831	Oranges	43,143	Grapes	12,735	Grapes	52,116	Grapefruit (Fresh or dried)	174,386
	Grapes	81,278	Tangerines, mandarins, clem.	36,802	Fruit Prp Nes	10,296	Pears	29,033	Orange (Fresh or dried)	133,363
	Fruit Fresh Nes	71,956	Dates	36,120	Oranges	9,907	Tangerines, mandarins, clem.	23,780	avocado (fresh)	131,657
Spices	Chillies and peppers, dry	14,585	Chillies and peppers, dry	123,290	Pepper (Piper spp.)	4,876	Chillies and peppers, dry	28,037	Ginger	122,492
	Anise, badian, fennel, corian.	8,318	Ginger	37,244	Spices, nes	1,125	Pepper (Piper spp.)	10,357	Pepper	69,051
	Pepper (Piper spp.)	2,679	Anise, badian, fennel, corian.	26,461	Chillies and peppers, dry	746	Anise, badian, fennel, corian.	4,198	Allspice	59,562
	Ginger	1,820	Pepper (Piper spp.)	23,942	Anise, badian, fennel, corian.	253	Spices, nes	3,178	Chillies fresh or dry	59,562
	Cinnamon (canella)	1,699	Spices, nes	20,179	Ginger	235	Ginger	2,550	turmeric	19,558

※since sources are different, the item indication of Japan and ASEAN4 countries are not equaled.

Source :ASEAN4 FAOSTAT (2010)Japan Ministry of Finance, Trade statistics (2011)

The recent economic growth of ASEAN4 countries is remarkable. GDP Per Capita in each four countries increases than about 2 times in ten years from 2000.

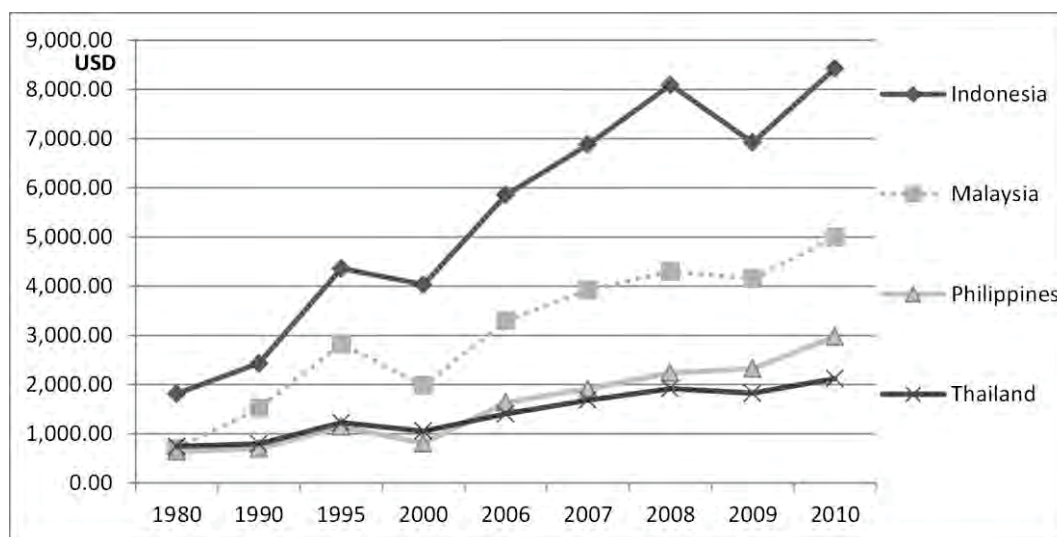


Figure IV-3 GDP per capita, current prices in ASEAN4

Source: Japan ASEAN Center, World Economic Outlook Database, September 2011

Not only the economic whole, but also income of the wealthy segment increase. Specially, the

average of the disposable income of highest 20% exceeds 80,000 USD and it may be said considerably rich in Malaysia

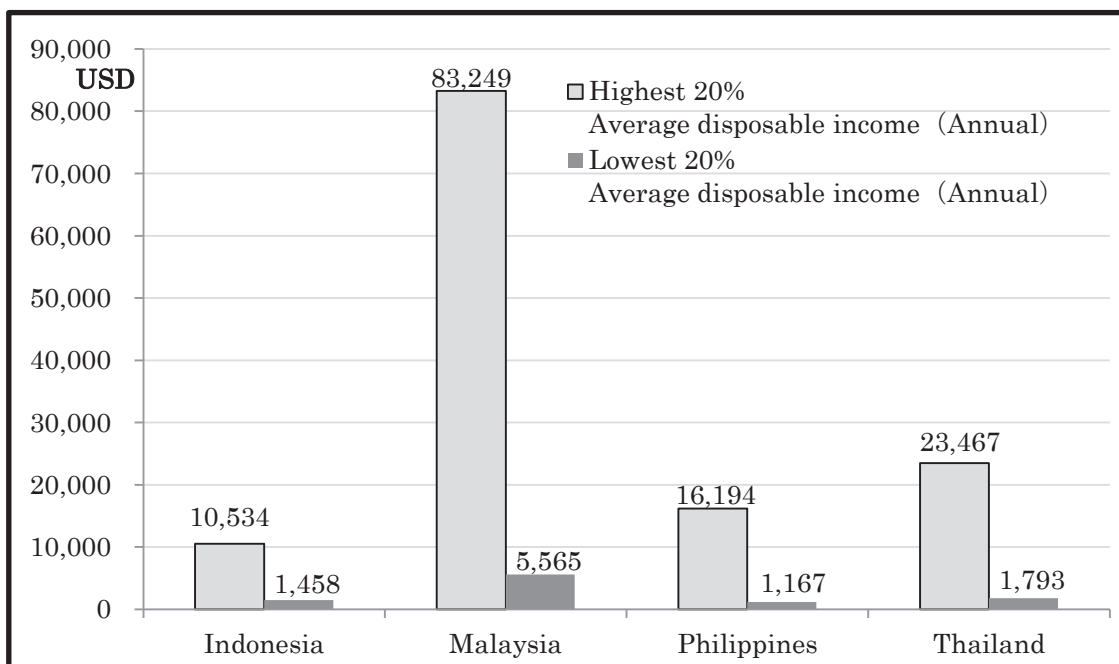


Figure IV-4 ASEAN4 countries distribution of income

Source: Euromonitor International 2010

Thus, ASEAN4 countries are importing agricultural products now, and economic development and the income increase of wealthy segment make the market attractive. This facts means that ASEAN4 countries are expected as high added value product markets in very near future.

On the other hand ASEAN4 countries request the regulations of quarantine and food labels as well.

It is necessary to acquire the organic authentication which each ASEAN4 country has its own system to appeal organic products. ASEAN4 countries also approved ASEAN GAP (Good Agricultural Practice) in November 2006. The each ASEAN4 country has its own GAP system, too and in Thailand, for example, QGAP which is the national GAP of Thailand spreads to 70% of all farmers. QGAP in Thailand and SALM program (Good Agriculture Practice Scheme Malaysia) as the National GAP in Malaysia have finish to synchronize with ASEAN GAP.

The ASEAN will complete free trade environment with abolition of the duty of agriculture products trade by 2015. For this purpose, the food safety module; module of extension and inspection system, one of the five ASEAN GAP modules established in June 2008 will be taken first priority to fix among the countries by the end of 2012.

Thus, the making standards of the agriculture product are completed in ASEAN4. As the result, to enter ASEAN4 markets are not necessarily easier than a Japanese market. Timor Leste must manage high quality standard to ASEAN4 countries as well as Japan.

CHAPTER V Potentiality of agriculture sector as leading industry

V.1 Selection of items or sub-sectors

V.1.1 Selection of items or sub-sectors

This study is to target the export of agricultural products; it is not practical to investigate and to promote all agricultural products grown in Timor-Leste. Therefore, it is important to clarify selection criteria to extract items or sub-sectors, and to focus on high potential candidates as exports varieties. It is decided to clarify the criteria for the selection and to create a long list of selected about 20 items by these criteria. In addition, about the allied industry in the vertical direction of the value chain, a required function role varies according to a production item. Therefore, it is effective to choose production item first and to clarify the request of the export partner and then to carry out concrete aid package for the associated industry.

A) Criteria for the selection of export candidates are the two groups, one is the items that the export market demands and other one is the items that Timor-Leste can produce at a little effort.

B) Items that the export market demands are the selection criteria in terms of the market, from the point of market demand trends, import status by category, competitive conditions of import countries, and requirements of export sales channels, it is required to refine the selection criteria and the candidate items more specific.

C) Items that Timor-Leste can produce at a little effort are the selection criteria in terms of the production, from the point of natural conditions such as climate and fertility, cultivation experience and technology, and also the difficulty of the cultivation of its own material, the difficulty of implementation, procurement and technology of equipment, it is required to refine the selection criteria and the candidate items more specific.

V.1.2 Export market demand

To examine the items that Timor Leste is easy to export, the Study Team tries to evaluate the Criteria of Competitor and QCD Evaluation.

A) The Criteria of Competitor

When Timor Leste tries to enter Japanese food markets, it is very important to consider competitors. Now Japan imports agricultural products from various countries, and among of them the agriculture developed countries such as USA or Australia provide cheap and high-quality products based on large-scale farming. It seems to be hard to compete with such products from those countries in the same condition.

On the other hand, the relatively easy products may be the ones from ASEAN4 countries (Indonesia, Malaysia, Philippines and Thailand). These items have already come to the market, so Japan market may diverse the supplier countries. In this reason, it is assumed to be easy to choose

items with high import ratio from ASEAN4 countries.

China is the second largest country to export agricultural products to Japan, so the items must be considered by large-scale farming items or others.

B) The Criteria of QCD Evaluation

QCD represents Quality, Cost, and Delivery. This combination of criteria has been originally used in the field of manufacturing, is now utilized in other fields like supply chain management. From the point of easiness of new entry, the Study Team made a general decision.

a) Quality Evaluation

The commodities which are rarely cultivated in Japan, or for which, the quality is, therefore, hard to determine correctly are relatively easy into Japanese market. On the other hand, commodities which are widely cultivated and popular in Japan sometimes require very high quality or special requirements by buyers. As the result, Timor-Leste products are hard to enter and are difficult to meet the standards.

b) Cost (Price) Evaluation

Because the production side has little charm about the cheap thing, the Study Team selects expensive items in Japanese market.

c) Delivery Evaluation

One of the reasons in Japan with much import of farm output products of the things is to be able to recruit them in a Japanese changeover period. Therefore the Study Team decides to choose an item which is shipped in a changeover period in Japan and is tolerate long-distance transportation

V.1.3 Product at a little effort

Keeping the conditions listed above, despite little export experience except coffee, the Study Team narrowed down subsectors (or, synonymously, commodities) of primary industry that posed export potential to Japan. The report describes the process of narrowing down in the following sections. Firstly, they had to be the commodities that Japan has imported from elsewhere, and currently produced or potentially could be produced in Timor-Leste. Secondly, the Study Team applied to these commodities the selection criteria, namely, (1) natural conditions, (2) necessity of initial investment including seeds, fertilizer, and tools, (3) difficulty in production and cultivation, (4) limitation in harvest and transport, and (5) difficulty in preprocessing by farmers. Further discussions on the selection criteria were given below.

A) Natural conditions

Animal and plant species of food and raw materials for cultivation are normally selected in accordance with the local natural conditions such as, climatic conditions, soil characteristics, water type, water temperature, distance to processing plant and market, and so forth. In addition, for those crops that enjoy economy of scale, land availability can be another constraint because its most economically efficient plot size might not be attainable in Timor-Leste. Even under ideal conditions in terms of climate and irrigation water, production cost for maize would be cheaper for large scale

production in open plains than in small scale in slope zones. This is because for the former case, animal traction or large tractor can be used for land preparation, but the latter has to rely on man-power. The following table summarized the conditions to which one should keep in mind.

Climatic Conditions	Topography and geographical conditions	Soil conditions
Temperature	Water sources	Soil depth
Precipitation and Pattern	Slope	Organic material contents
Sunshine Duration	Size of plain	Fertility (C-N ratio)
	Distance from storage and market	Viscosity
Typhoon, frequency and strength	Water-holdability/drainage	Permeability
	Size of fish pond	
	Water quality	
	Water temperature	

Figure V-1 Example of natural conditions for subsector selection (Made by the Study Team)

There are a broad range of agricultural products in the present day, and using the these natural conditions and physical limitations, the Study Team examined the food items imported by Japan if Timor-Leste could be a supplier of them.

B) Necessity of initial investment including seeds, fertilizer, and tools

MAF distributes free rice seeds and other inputs to farmers aiming an increase in rice production, which is one of the staple grains. The farmers who employ Integrated Crop Management (ICM) and line planting are the targets of subsidies including, chemical fertilizer, herbicide, and fuel. The following figure show the flow of agricultural subsidies from application by farmers to distribution by MAF.

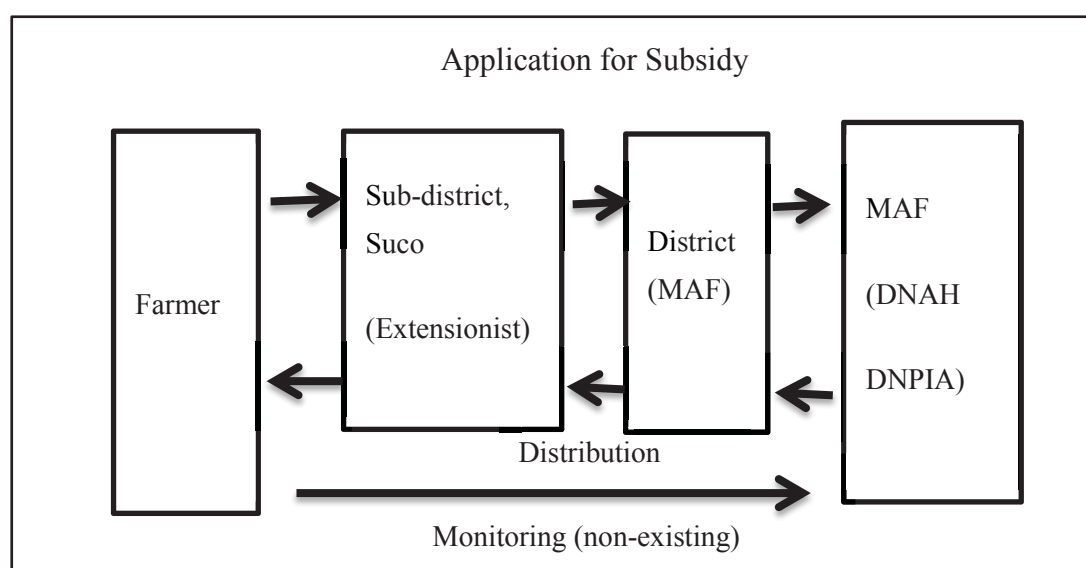


Figure V-2 Flow of subsidies from application by farm to distribution by MAF

(Source: Developed by the reporter based on JICA, 2011)

Crop seeds are distributed through such programs as FAO supported distribution, Seeds of Life program supported by AusAID, or MAF's direct procurement from Indonesia. MAF is currently not able to secure sufficient quantity of seeds to meet the demand from the districts. In order to overcome seed shortage, MAF selected farmers for certified seed multiplication with support from Seeds of Life in 7 districts, however, the quantity and quality of seeds produced have not yet met the requirement.

Fertilizer and pesticide are imported from Indonesia, but due to their high prices, they are rarely used by farmers. As support for the farmers, the Government distributed 2,842 tractors to the districts between 2006 and 2009 and provide plough service to farmers free of charge. There were such farmers who had received MAF's plough service among the farmers whom the Study Team interviewed. It is difficult how well this service is implemented nationally due to the lack of functioning monitoring system.

C) Difficulty in production and cultivation

When it comes to promotion of export-oriented primary industry, it is essential to maintain both quality and quantity of selected commodities in order to establish good reputation as a reliable supplier. Should the selected commodities be currently produced in Timor-Leste, no matter how small quantity, it would be a good start because improving such commodities is normally easier than introducing new ones. In order to induce improvement, farmers need to learn new techniques and management skills, and promoters and/or investors should correctly estimate for the size of prospective leap in skill level, and then, select commodities to promote, accordingly.

For instance, let us suppose a farmer wanted to increase mango production, which is facing no major problem in Timor-Leste at this moment. There would be a lot of new things for her/him to learn. She or he would need more than trees planted just around the homestead, but those in a substantial size of mango groves, where trees are placed in regular rows so that all trees would be able to get sufficient water, nutrients, and sunlight. In addition, other things to consider are, honeybees should be brought into the groves for pollination at a right timing, thinning young fruits is desirable, and so forth. Furthermore, pest problems could be worse for monoculture, but organic farming does not allow farmers to apply chemical pesticides. Farmers needs to adopt other methods such as biological control and pheromone trap. Thus, although the current Timorese agriculture is organic by default, in order to achieve high yield, farmers need to learn new techniques.

According to our interviews with local farmers, for all commodities, there is a large gap between farmers' capacity and the required skills; it is indispensable to motivate farmers to produce high quality agricultural products.

For these reasons, for the short-run, those agricultural products that can be demanding in terms of cultivation and pre-processing should not be considered for export. If farmers' moral becomes high in the middle to long-run, producing products with greater difficulty could be introduced and/or promoted.

D) Limitation on Harvest and Transportation

The preceding JICA study in 2011 summarized the problems faced by Timor-Leste in terms of

transportation and delivery. In short, the following points were listed.

- a) Undeveloped road systems damp the efficiency in transportation.
- b) Accompanied by the above, undeveloped port and water transportation systems worsen the problem.
- c) Nonexistence of cold chain and too few warehouses.

This underdeveloped state in terms of infrastructure raises transport cost, and, in turn, hinders agribusiness. Not only infrastructure, shortfall is troublesome in terms of knowledge and experience; the study also pointed out that existing distributors showed great weaknesses in management and that little information on agriculture and market reaches farmers. For these constraints, it is difficult to consider those agricultural products, that require storage in site or prompt delivery for export.

E) Difficulty in Preprocessing by Farmers

Preprocessing helps agricultural products to overcome perishability, and thus, greatly widens the list of agricultural products for export. For example, raw gherkin (smaller cucumber, also belonging to *Cucumis sativus*) cannot be imported into Japan due to regulation, but permitted to do so if pickled. Our investigation revealed, for spices and non-essential commodities, the preprocessing levels of Timorese farmers were very primitive, which indicated currently farmers could not meet the required qualities for exporting the products to Japan. Timor Global's story depicts this problem vividly; no matter how many times Timor Global asked the farmers to carefully sort out debris from cloves, there were so many of them that Timor Global has to sort again, by themselves. This indicates the preprocessing more complicated than drying and sorting done by farmers requires extra caution in terms of quality.

For this reality, extra assistance is indispensable if producers (farmers) are expected to finish preprocessing, such as salting, pickling, and fermentation; especially those involving advanced knowledge.

V.2 Challenges and conditions for the candidate items

V.2.1 Selection of Candidate of items

The results of this study will present the two long lists, 23 items from the perspective of the seller and producer and 15 items from the perspective of the buyer, but it is not intended to argue that those two lists are absolutely right. Those are the lists of evaluation and judgment through several evaluation items, some items are evaluated the same by anyone and some other items are evaluated differently by the evaluator. More important point is the logic steps of evaluation and decision to reach the lists; it is also able to share it. By clarifying the logic steps, it is possible to reproduce the selection process at any time, also can be a reference for extending the material.

This study is kept to be presented two long lists of 23 items and 15 items described above. In order to perform the economic calculation in the second stage of the FS to be performed separately, it

is necessary to focus on 5-10 items. This is because of the technical limitations when performing economic calculations, if necessary, the simulation calculation by replacing items is possible.

A) Method & procedures

The Study Team has selected 23 potential crops for exporting to Japan from over 470 items. These items are grouped into 5 categories; grains, vegetables, fruits, stockbreeding, and seafood. The items are filtered by two critical conditions as import restrictions by Japan and cold chains as a first step. Subsequently, conditions in cultivation, processing and market side factors are utilized for filtering.

B) Food market size of Japan by categories and by import/export

To get a picture of Japanese food market, the Study Team studied the value of domestic production and import, and the Study Team segmented the market with following five categories such as “grains”, “vegetables and beans”, “fruits and nuts”, “meats” and “seafood.” There are no one-source data available for Japanese food market which is provided by government or government related officials, so the Study Team use Annual Agricultural Gross Production by Ministry of Agriculture, Forestry and Fishery for Production for domestic production; and Summary of Trade Statistics by Category by JETRO Agro Trade Handbook 2011 for import, and the both data is available for the year 2010.

In accordance with the data, Japanese food market size in year of 2010 is approximately USD 132 billion, and approximately USD 36 billion of vegetables & beans is the biggest category and one-third of the vegetables & beans market is fruits & nuts with approximately USD 13billion as the smallest category.

In terms of import, approximately USD 37 billion is the total market size for year 2010 and the import value consist of 28% of the total market. Approximately USD 11 billion of meat is the biggest category, and then seafood, vegetables & beans and grains follows it. The smallest category is fruits & nuts with its market size of USD 4billion.

Table V-1 Food market size of Japan in year of 2010

(in thousands of USD)

	Annual Agricultural Gross Production		Summary of Trade Statistics by Category		Total
	Value of Production	Component Ratio	Value of Import	Component Ratio	
Grains	20,106,250	71.8	7,880,473	28.2	27,986,723
Vegetables & Beans	31,468,750	88.6	4,038,793	11.4	35,507,543
Fruits & Nuts	9,371,250	70.1	4,001,613	29.9	13,372,863
Meats	16,078,750	59.4	10,984,550	40.6	27,063,300
Seafood	18,532,500	65.7	9,687,205	34.3	28,219,705
Total	95,557,500	72.3	36,592,634	27.7	132,150,134

Source : Annual Agricultural Gross Production by Ministry of Agriculture, Forestry and Fishery for Value of Production

Summary of Trade Statistics by Category by JETRO Agro Trade Handbook 2011 for Value of Import

Exchange rate: \$1=Yen80.00

C) Picked up items and coverage for import market from JETRO Trade data

To study possibilities of export agricultural products from Timor Leste to Japan, the Study Team studies on items picked up from the JETRO Trade data by the categories of grain, vegetables & beans, fruits, meat and seafood. The Study Team limits the picked up items in accordance with the procedure provided in Chapter V.

The Study Team compares how much the coverage of “Picked up items from JETRO Trade Data” against the Japanese food market sized mentioned in Chapter IV.

Number of items picked up from the JETRO Trade Data is 44 in grain, 148 in vegetables & beans, 100 in fruits, 58 in meat, and 121 in seafood; and total number of items are 471.

In terms of component ratio in the Table V-2, ratio of vegetables & beans and seafood categories are bigger than 100%. This is caused because that Agro Trade Data’s latest version is for year 2010 while the JETRO data is from year 2011. Those comparisons is not in line in this Interim Report, the Study Team will provide the data which shows the latest Japanese market with bigger coverage and compare with JETRO Trade data in the Final Report.

Table V-2 Pickup items and coverage for import market from JETRO trade data
(in thousands of USD)

	Annual Agricultural Gross Production		Summary of Trade Statistics by Category		Total	Picked up items from JETRO Database (in year 2011)		
	Value of Production	Component Ratio	Value of Import	Component Ratio		# of Items	Value of Import	Component Ratio
Grains	20,106,250	71.8	7,880,473	28.2	27,986,723	44	7,595,895	96.4
Vegetables & Beans	31,468,750	88.6	4,038,793	11.4	35,507,543	148	4,675,548	115.8
Fruits & Nuts	9,371,250	70.1	4,001,613	29.9	13,372,863	100	3,042,220	76.0
Meats	16,078,750	59.4	10,984,550	40.6	27,063,300	58	9,935,681	90.5
Seafood	18,532,500	65.7	9,687,205	34.3	28,219,705	121	11,459,201	118.3
Total	95,557,500	72.3	36,592,634	27.7	132,150,134	471	36,708,546	100.3

Source : Annual Agricultural Gross Production by Ministry of Agriculture, Forestry and Fishery for Production

Summary of Trade Statistics by Category by JETRO Agro Trade Handbook 2011

Exchange rate: 1USD=JPY80.0

D) Selection Process by 2 “Critical Conditions”

Consequently, in accordance with the JETRO database, there were 471 items (or, interchangeably, sub-sectors) the subjects of our selection process. The first category of the selection criteria was named as the “critical conditions” for convenience. There were two of the kind: 1) Japan’s trade regulations, especially, import restrictions and 2) necessity of cold chain. The first criterion concerned the regulations on plant and animal product imports and import quotas. The second one is crucial because marine transportation takes 4 weeks between Dili and Japan on top of substantial time to collect agricultural products from the rural areas.

The first critical conditions screened out 230 items, including fresh fruit vegetables such as cucumber family ones, which are susceptible to insect pests, and those subject to import quotas such as tapioca flour. The second critical condition eliminated all aquatic products, animal and dairy products, and most of the fresh vegetables and fruits; in total, 138 items.

As a result, this stage selected 102 item for next stage.

E) Evaluation of Items Using 5 Criteria of Production Side

At this stage, all of the items left for further consideration were plant products, so that the Study Team evaluated their exportability by the requirements from the following criteria.

- a) Natural conditions,
- b) Size of initial investment,
- c) Difficulty in cultivation,
- d) Durability in transportation,
- e) Difficulty in preprocessing.

Natural conditions sieved only few such as rye. Initial investment filtered those items that would require such modern facilities as tunnel greenhouses and field modernization in order to produce export-worthy products. The difficulty in cultivation would be a common challenge among all the products if export is considered. Especially, when it comes to export to Japan, cultivation techniques can be demanding; for instance, yam in Japan is grown in cylinder in order to shape it straight, whereas it would be normally left unattended in Timor-Leste.

The durability in transportation concerns those crops susceptible to damages during transportation such as bruise. This applies to all fresh produces that would be either consumed fresh or processed in distant commercial centers such as Dili. At last, processing actually concerns “preprocessing” meaning relatively easier techniques to improve the durability of the produces, such as boiling, pickling, salting etc. before handing the products to buyers. Even though, these preprocessing techniques are deemed to be easy, considering that the Timorese farmers understand little about quality control, such products should not be considered for export.

As a result, 44 items were eliminated at this stage, and 58 items were selected for the next stage.

< The Criterion of Competitor >

Many countries export agriculture products to the Japanese market right now. The commodities from the agriculture developed countries such as the United States or Australia that are cultivated in large-scale and well-managed are cheap and of high-quality. Therefore, the Study Team evaluates these commodities from those countries as disadvantaging the commodities from Timor Leste, and thus, eliminated them.

On the other hand, Timor Leste has a chance to substitute the commodities from ASEAN countries.

The Study Team eliminated 14 commodities and 44 commodities were left for the next evaluation.

< The Criteria of QCD Evaluation >

QCD represents Quality, Cost, and Delivery. This combination of criteria has been originally used in the field of manufacturing, is now utilized in other fields like supply chain management. The Study Team examines each criterion by the heuristic method with some statistical data. The Study Team ranks “A”, “B” and “C” depending on the advantage.

a) Quality Evaluation

The Study Team sets “A” for the commodities which are rarely cultivated in Japan, and for which, the quality is, therefore, hard to determine correctly. On the other hand, “C” is for commodities which are widely cultivated and popular in Japan. These types of commodities sometimes require very high quality or special requirements by buyers and are difficult to meet the standards. “B” is medium of this criterion.

In fact, there are various requirements among buyers in Japan, but the Study Team wasn’t concerned about buyer types at this time. For example, a retailer makes much of appearance; a processor makes much of standardization or weight because of machinery processes; a food service

company gives top priority to the uniformed size and securing of contract amount. These concrete requirements will be used after to selecting the 20 items.

b) Cost (Price) Evaluation

The Study Team refers to the trade statistics by the Ministry of Finance of Japan. “A” is over 1.0 US dollar per kilogram as a CIF value which includes freight and insurance at a port in Japan. “B” is between 0.5 and 1.0 dollar per kilogram and “C” is as less than 0.5 dollar per kilogram.

c) Delivery Evaluation

The Study Team set “A” for the commodities which are available in changeover periods in Japan or have some advantage on delivery. “C” is for the commodities with some disadvantage. “B” is medium with regards to this criterion.

F) The result of selection

Among the 44 commodities remained after the selection by competitors, 23 of them acquired “A” in all criteria. Thus, the Study Team makes these 23 commodities the final candidates from the long list.

Further, each combination such as; “Mace” and “Nutmeg”; “Pecan (Fresh)” and “Pecan (Dried)”; “Coconuts (Fresh)” and “Coconuts (Dried)” are the same kind, so the number of the items on the long list is 20 in essence.

Table V-3 The long list of commodities

No	The name of commodities
1	Vanilla bean
2	Mace
3	Nutmeg
4	Cardamom
5	Cloves
6	Pepper
7	Anise seed
8	Allspice
9	Turmeric
10	Dry onion
11	Fennel
12	Mungbean (Dried)
13	Coriander seed
14	Fenugreek
15	Pecan (Fresh)
16	Pecan (Dried)
17	Mango (Dried)
18	Cashewnut (not shelled, Dried)
19	Papaya (Dried)
20	Coconuts (Fresh)
21	Coconuts (Dried)
22	Banana (Dried)
23	Dates(Dried)

G) 15 products found out from the sample hearing to Japanese companies

Upon the sample hearing to the Japanese companies, the Study Team showed them the list of 23 products selected by the process shown in V.1, and ask them for their interests, then the Study Team also heard from them with their products of interest which is not affected by critical conditions, other constraint conditions from production side or market side. Following is a list of the products of interest by the Japanese companies.

Table V-4 List of products of interest by the Japanese companies

	Industry	Item
1	Speciality Trading Company	Vanilla Bean
2		Clove
3		Nutmeg
4		Pink Pepper
5	Supermarket	Pumpkin
6		Frozen soybean in pod
7	Food Material Retailer	Onion
8		Pumpkin
9	Restaurant	Yam
10		Burdock Root
11		Garlic (chopped or paste)
12		Onion (Paste)
13	Food Manufacturing Company	Pepper
14		Cardamon
15		Dried Fruit
16		Fruit Prserved in Syrup
17		Onion (Paste)

Following table is the list which summarize the previous table, and considering the necessity of preprocess for example cut, boil, grate, sauté or dry, and also considered with requirement of freezing or cold chain.

Table V-5 Summary of the products by the Japanese companies

	Item	Cold Chain	Primary Processing
1	Vanilla Bean		
2	Clove		
3	Nutmeg		
4	Pink Pepper		
5	Pumpkin		
6	Frozen soybean in pod	○	○
7	Onion		
8	Yam (grated)	○	○
9	Burdock Root pre-cooked with other vegetables		○
10	Garlic (chopped or paste)	○	○
11	Onion (Paste)	○	○
12	Pepper		
13	Cardamom		
14	Dried Fruit (Mango, Papaya & Fig)		○
15	Fruit preserved in syrup	○	○

There are seven products which require primary processing. The Study Team had information that for example even the cut of burdock root into the same size would be very difficult, so the primary processing cannot be easy.

There are five products which require cold chain. According to the hearings, the Study Team investigated the cost of the equipment of cold chain with the minimum of USD250,000- to the maximum of USD2,500,000, and freezing the products require highly skilled technique, for example temperature control on frozen soybean in pot have to be taken care of surface and core to keep its taste fresh.

The 15 products of interest by the Japanese companies requires primary processing and cold chain, while the 23 items selected by the Study Team require only selection and dried out in which need to take new technologies or equipments. It would be realistic that the export shall start with the products with existing technique, and gradually move to the products require for primary processing and/or cold chain.

V.2.2 Current state of agriculture production

A) Agriculture production

< Current production system >

About 80 % of total population of Timor-Leste depends on agriculture, and the majority of it is primitive subsistence farming where little input is applied to farmland, and in turn, return is very low. Census 2010 revealed the types of agricultural production and the household numbers that were

engaged in agricultural production. The number was 116,426, of which, 88% produced maize, and only 39% did rice although viewed as the most valuable crop (discussed further later).

Table V-6 Number of households that were engaged in agricultural production in 2010

Crop	Household	share to all households	share to households in production
Households engaged in production	116,426	64.1	100%
Rice	45,672	24.7	39%
Maize	102,346	55.4	88%
Cassava	94,833	51.4	81%
Vegetable	78,605	42.6	68%
Fruits (seasonal)	88,245	47.8	76%
Fruits (permanent)	86,526	46.9	74%
Coffee	51,358	27.8	44%
Coconut	76,833	41.6	66%
Other seasonal crops	83,923	45.4	72%
Other permanent crops	85,354	46.2	73%

(Source: Timor-Leste, Population and Housing Census 2010)

Timorese agriculture is in the very early stage, normally and solely depending on local knowledge. Irrigation water is greatly influenced by rainfall, environment, and topography, and thus, crop growth after sowing is out of human control. The source of labor force is mainly family members, and communal group work is commonly observed during the busy seasons. The agricultural productivity is viewed to be low (however, this might not apply to labor productivity), the annual average yield per hectare in 2011 was 1 ton for rice, 1.25 ton for maize, then, 7.5 ton for tuber crop (Timor-Leste, 2011, p. 112). Excess of these crops after home consumption is sold. These characteristics apply to both two major types of Timorese agriculture, namely, upland cultivation in the slope zones and the lowland rice-centered agriculture.

Lowland Rice-Centered Agriculture:

A broad range of crops, rice at the first of the list, can be grown in lowland plains. Farmers prefer growing rice wherever possible because rice is the most preferable staple food; the value placed on rice is so high that lowland rice fields are viewed as the most productive. According to the interviews with farmers in Baucau and Lautem Districts, the average rice yield per hectare was about 4 tons. If there is not enough water for rice cultivation, farmers grow other crops such as maize, cassava, vegetable, mangos, coconuts, candlenuts, and cocoa.

Upland cultivation in the slope zones:

In the slope zones, it is difficult to secure water for farming, hence, paddy rice cultivation is rare, but often upland rice is cultivated. Other crops include maize, cassava, potato, pumpkin, beans, vegetable, sisal, peanuts, mangos, coconuts, pineapple, and citrus. JICA (2011) reported that, in addition to the agricultural types abovementioned, following types of farming.

Mixed culture around homestead:

About 0.5 hectare of land is cultivated to grow aforementioned crops.

: Industrial crop production in highland and lowland (coffee, coconuts etc.)

: Gathering forest products such as tamarind, candlenuts, yam, and firewood.

These forms of primary production activities are selected or combined in accordance with the various local conditions.

< Production Cost >

Due to primitive operation techniques, all the farmers interviewed did not have any written record on agricultural production inputs and labor. Among farmers who were engaged in non-essential agricultural products, there were large farmers with areas around 10 hectares (22 acres) who's farming schemes were those of organic ones by default because they have used no chemical fertilizer or chemical pesticide. In principle, labor source is family members, but during the busy seasons, farmers sometimes hire workers. Daily wage of a worker is between USD 3 and 5; otherwise farmers pay in kind payment such as coffee cherries freshly harvested by the laborer.

For the production of crops that are promoted by the government such as rice and maize, MAF provides seeds and land preparation service using tractor for no charge. For coffee production, CCT brings and sells its members 100kg harvest sacks at about USD 1 each. Local middlemen visit the member farmers to collect coffee, but the members have to bring other types of produces to local markets, and/or to collection points and warehouse of traders such as CCT and Timor Global. Kmanek, Dili's supermarket, contracts out vegetable production to farmers distributed in a 1 hour-drive radius from Dili, and sends trucks to their collection points to load up the produces. When farmers bring their produces to Dili, they often hire a middle size truck called "angguna" in local language.

< External resources for production >

In Dili, the capital city, there are new retailers of agricultural input materials. This indicates that agricultural production techniques are slowly shifting from traditional to modern ones. Seeds and materials are mainly imported from the neighboring countries, such as Indonesia, Australia, and Singapore. Planet Agriculture Store is a serious seed dealer who imports and sells products of Takii, Chia Indonesia, East-West, including maize, leafy vegetables, and fruit vegetables. Hero International deals hand-tractors, maize mills, large electric generators, chainsaws, and Makita electric tools and so forth; their customers are government organizations, NGOs, and wealthier farmers of large scale in Bobonaro, Baucau, and Lospalos where larger floodplains are distributed. These companies do not have branches in other cities in Timor-Leste.

In addition, there are a number of small general shops in Dili that sell small agricultural tools such as scythes and hoes. In rural areas, local blacksmiths produces those tools and/or, local vendors sell imported ones.

B) Food crops

a) Rice: besides maize, rice is the major staple grain. The recent rice production of Timor-Leste was 120,774 ton in 2009 and 112,925 tons in 2010. Among the districts, Baucau was the largest producer with 34,024 tons in 2010. The numbers of rice farmers by district in 2004 showed Baucau and Viqueque were the top 2 with 12,967 households (27% to the total number of households) and 11,743 households (19%, likewise), respectively (JICA, 2011). It is expected that rice production will increase as the improved varieties and fertilizer application become common and irrigation systems are rehabilitated.

b) Maize (corn): Maize is a common crop in the slope zones in the forms of mixed culture or as an alternative crop. It seems that modernizing varieties can increase production since the current production level is quite low and post-harvest loss is significant. Simply improving these shortcoming should be able to contribute to food security great deal. The recent production data showed the total size of maize cultivation of 70,255 hectares and the total production of 148,891 tons. Lautem district is the largest producer with 42,106 tons (28% of the national total). Maize farmers were most numerous in Ermera, Baucau, and Bobonaro districts (JICA, 2011).

c) Tuber crops (cassava, sweet potato, and potato): tuber crops are produced by the form of mixed culture as backup food sources in case of crop failure in rice and maize production. The production levels of tubers in 2008 were 35,500 tons for cassava, 9,000 tons for sweet potato, 2,600 potato. The numbers of farmers engaged in cassava production in 2008 was the largest in Ermera with 18,638 households (14% of the total). Population and Housing Census of Timor-Leste in 2010 reported 2,077 tons of potato production (JICA, 2011).

d) Beans (soybean, mungbeans, peanuts): crop rotation of rice and beans should be promoted more since it is beneficial to soil fertility. However, the production levels of beans have been relatively low in Timor-Leste. In 2008, soybean production was 800 tons, those of mungbean and peanuts were 1,200 tons and 1,300 tons, respectively. The largest bean producer in 2008 was Bobonaro District (JICA, 2011).

e) Horticulture: the following table shows the changes in the production of horticultural crops from 2008 to 2010. For vegetables, those produced in larger quantities included cabbage, mustard, onion, beans, and pumpkins. There are various fruits, and mango and avocado were most abundant. There are some rare tropical fruits such as rose apple, custard apple, and rambutan, though in smaller quantities.

Table V-7 Production of vegetable and fruit crops from 2008 to 2010

total production (ton)		Year		
	Crop	2008	2009	2010
Vegetable	Onion	1,066.4	1,272.5	1,327.0
	Garlic	550.2	597.5	639.0
	Lettuce	285.0	406.2	422.6
	Cabbage	2,520.8	3,084.8	2,005.5
	Mustard	2,700.8	2,880.6	3,329.5
	Spinach	492.9	502.4	477.0
	Watercress	491.4	593.3	1,725.1
	Cauliflower	72.0	135.0	126.9
	Tomato	129.5	296.1	565.0
	Carrot	653.1	758.0	1,149.5
	Eggplant	49.8	390.4	450.0
	Cucumber	273.0	273.0	273.0
	Pumpkin	459.9	1,051.5	1,085.9
	Squash	1,121.4	1,121.0	650.0
	Paprika		79.8	77.7
	Chilli pepper	94.9	301.3	1,169.6
	Bitter gourd	0.4	84.1	224.0
	Beans	2,922.4	2,922.4	2,922.0
	Longbeans	32.3	48.4	154.0
	Chinese celery		13.6	101.4
Fruit	Avocado	3,550.0	3,440.0	3,440.0
	Mango	6,367.0	6,367.0	6,117.0
	Jackfruit	1,933.0	1,933.0	1,901.0
	Tangeline	1,688.0	1,688.0	1,688.0
	Jambu be (Water apple)	93.0	93.0	93.0
	Papaya	1,962.0	1,962.0	1,977.0
	Banan	709.0	709.0	709.0
	Custard apple	18.2	18.2	18.2
	guava	105.0	105.0	140.0
	Breadfruits	709.0	709.9	709.9
	Belimbi (Star Fruit)	18.4	18.2	18.2
	Pineapple	105.7	105.7	105.7
	Rambutan	10.8	10.8	10.8
	Lime/Lemon	-	-	144.8

(Source: MAF National Directorate for Horticultural Crops)

C) Industrial Crop

For Timor-Leste, in pursuing agricultural development, industrial crops will continue occupying a significant importance. The table below lists a broad range of industrial crops, but except coffee, their commercialization is greatly lagged behind (JICA, 2011).

Table V-8 Production of industrial crops (2011)

	Possible Area (ha)	Area under Production (ha)	Production (ton)	Productivity ton/ha
Coffee	55,385	23,583	7,936	0.34
Coconuts	18,977	18,598	11,310	0.61
Candlenuts	5,762	5,647	1,111	0.20
Cacao	1,050	1,029	20	0.02
Clove	63	63	3	0.04
Areca nut	7,973	7,814	156	0.02
Kapoc	1,572	1,542	30	0.02
Lime/Lemon	1,156	1,131	25	0.02
Cashewnuts	4,184	4,101	82	0.02

(Source: National Directorate of Industrial Crops and Agribusiness, MAF)

Table V-9 (No.1) Production of industrial crops by district

(a; Area under production (ha), b; Productivity (ton/ha))

Production in 2011	Coffee		Coconuts		Candlenuts	
	(a)	(b)	(a)	(b)	(a)	(b)
Timor-Leste	23583	7936.5	18598	11310	5647	1111
Aileu	875	242.36	12	4	25	1
Alinara	1813	987.69	650	195	796	15
Baucau			3200	960	97	2
Bobonaro	1462	414.28	2122	6366	942	19
Covalina	150		697	209	927	279
Dili			38	11	1066	326
Ermera	12982	3673.2	8	2	0	0
Lautem	0	0	4119	1236	6	0
Liquisa	3427	1047	515	155	24	1
Manatuto			233	70	409	123
Manufahi	2874	1572	615	185	62	1
Oecusse/Ambeno			640	192	158	3
Viqueque			5749	1725	1135	341

(Source: National Directorate of Industrial Crops and Agribusiness, MAF)

Table V-10 Production of industrial crops by district
(a; Area under production (ha), b; Productivity (ton/ha))

Production in 2011	Cacao		Clove		Aceca nuts	
	(a)	(b)	(a)	Product	(a)	(b)
Timor-Leste	1029	20	63	2.5	7814	156
Aileu	0	0	12	2.5	6	0
Alinarao	14	0	5	0	597	12
Baucau	10	0	2	0	87	2
Bobonaro	83	2	9	0	832	17
Covalina	0	0	0	0	368	7
Dili	0	0	7	0	7	0
Ermera	394	8	5	0	6	0
Lautem	4	0	4	0	69	1
Liquisa	0	0	4	0	21	0
Manatuto	0	0	0	0	54	1
Manufahi	5	0	9	0	489	10
Oecusse/Ambeno	0	0	6	0	299	6
Viqueque	519	10	0	0	4979	100

(Source: National Directorate of Industrial Crops and Agribusiness, MAF)

Table V-11 Production of industrial crops by district
(a; Area under production (ha), b; Productivity (ton/ha))

Production in 2011	Cottonwood (Kapok)		Lime/Lemon		Cashewnuts	
	(a)	(b)	(a)	(b)	(a)	(b)
Timor-Leste	1542	30	1131	25	4101	82
Aileu	18	0	38	1	86	2
Alinarao	157	3	89	2	12	0
Baucau	22	0	93	2	4	0
Bobonaro	87	2	82	2	1038	21
Covalina	52	1	129	3	1107	22
Dili	19	0	8	0	67	1
Ermera	15	0	0	0	12	0
Lautem	38	1	82	2	9	0
Liquisa	608	12	44	1	35	1
Manatuto	33	1	238	5	605	12
Manufahi	12	0	93	2	474	10
Oecusse/Ambeno	445	9	96	2	303	6
Viqueque	36	1	139	3	349	7

(Source: National Directorate of Industrial Crops and Agribusiness, MAF)

a) Coffee: Coffee is the most popular export crop of Timor-Leste. It is widely grown throughout the country, and Ermera District is the largest producer with 12,982,400 ha dedicated to coffee and a total of 3,673 tons is the half of the national total production. It is followed by Manufahi, Liquiça, Ainaro, and Bobonaro in this order. The coffee industry creates employments as well; in 2010, 51,358

households were engaged in coffee production according to the census. Cooperativa Café Timor (CCT) is the largest body of the country in terms of economic activity (JICA, 2011).

b) Coconuts: In Timor-Leste, coconut trees are distributed in everywhere, which implies its large production potential. In turn, this wide distribution makes it difficult to accurately estimate for the total area and production of coconut production. However, the record in 2011 shows that 18,598 ha were dedicated to coconuts and 11,310 tons of coconut fruits were produced. The number of households engaged in coconut production was 76,833, which were distributed in Bobonaro, Lautem, and Viqueque, whose combined share in coconut production surpasses 80%. Copra, the fleshly part of coconut fruit, is also used as the raw material to produce cooking oil, cosmetic oil, and soap. In addition, the coconut leaves are used as a construction material for roofing.

c) Candlenuts: It used to be an important income source for many households. Recently, the candlenut production decreased due to a reduced export caused by eroded quality and Indonesian buyers had withdrawn from Timor-Leste (JICA, 2011). In 2011, a total of 5,647 ha were used for candlenut production, and 1,111 tons were produced.

d) Other industrial crops: There are areca nuts, cashew nuts, vanilla, kapok, cacao, clove, pepper, oil palm were listed, and their production scales were rather small (JICA, 2011). Although Japan bans importing areca nuts, it is widely grown in the country; the areas under areca nut production were 7,814 ha and the total amount produced was 156 tons in 2011. Viqueque is the largest producer whose share is 60%. Probably, the one of reasons for cashew nut is gaining its popularity is the promotion by the National Directorate of Industrial Crops and Agribusiness of MAF as a target crop; its production increased to 4,101 ha in 2011 from 1,635 ha in 2009. Clove, pepper, and vanilla are grown in mix-cropping with coffee or have been promoted by CCT and Timor Global as alternatives of coffee in Ermera and Liquiça (Correia et al., 2009).

D) Animal Husbandry

In subsistence agriculture, farmers raise animals including chickens, pigs, goats, sheep, cattle/cows, and buffalos. Among these animals, cattle/cows are the most valuable livestock (JICA, 2011). Population and Housing Census in 2010 found 86% of all households possessed some sort of livestock. The following table summarizes the numbers of such households.

Table V-12 Numbers of households that owned livestock in 2010

Livestock	Household	% to all households	Number of animals.
number of household owning livestock	147,665	86.0%	
Chicken	124,658	67.5%	702,474
Pigs	123,862	67.1%	330,435
Sheep	6,957	3.8%	41,854
Goats	45,781	24.8%	152,360
Horses	27,691	15.0%	57,819
Cattle/Cows	43,028	23.3%	161,654
Buffalos	19,199	10.4%	96,484

(Source: Census 2010)

Small farmers tend to own more livestock. Chicken, pigs and goats are owned by many farmers, and there is difference among districts for horses and sheep. For example, Population Census in 2004 also recorded the numbers of domestic animals, and the population of cows was large in Bobonaro (24,869 heads) and Oecussi (21,428), for sheep, Baucau (26,098), for buffalo, Viqueque (26,411) and Baucau (17,311). Live cattle were exported to Indonesia through West Timor; in 2005, 2,400 heads of cattle of USD 680,000 worth were exported (Commodity profile “Cattle”, 2008, DNPIAC). Pastureland is distributed throughout the country and the total area is 200,000 hectares; they are natural grasslands. Livestock animals graze in these grasslands, which, in turn, can cause land degradation and soil erosion; this problem has to be taken care of in the near future. Processing and retail face challenges as well; it is necessary to build modern abattoirs and to establish the systems of hygiene and sanitary management at the points of export and import.

E) Fishery

Owing to its 735 km long coastline and 75,000 km² of exclusive economic zone (EEZ), Timor-Leste possesses rich marine resources, and thus, the potential of coastal fishery is expected to be high. A wide range of fish species can be found, including tuna, bonito, milkfish, parrotfish, beams, dolphinfish, and sea cucumber. As for indicators of fishery for the 2007-2009 period, the total number of fishermen were 5,265, the total catch was 3,200,000 tons (USD 6,400,000), the total number of fishing boats was 2,948, of which 615 were equipped with motor engine. According to district-wise data, the area around Dili was the busiest in terms of fishery, and its share was about 40 % of total fish catch and fishermen population of Timor-Leste. The Atauro Island belongs to Dili district, and produced and exported to Indonesia 65,000 tons of seaweed called “karoja”, which was of worth USD 48,750 (JICA, 2011).

V.2.3 Shipments

A) Processing, Quality Control, Cost, Labor Quantity and Quality

In the present days, those crops promoted targeting import substitution including grains, beans, tubers, and common vegetables such as onion and carrot, pose little immediate export potential. However, combining the improvement in quality and quantity, once delivery and cold chain systems are established, exporting those crops to neighboring countries would become very feasible. Especially, if Timorese agriculture remains organic, it would be possible to find buyers in Japan.

The crops with high immediate export potential to Japan are those that are light, durable, and high-value. This is because except coffee, Timor-Leste produces small quantities of each and it takes time to transport anything by boat, it would be more realistic to consider to export high-value commodities by airplane. Therefore, spices and herbs can be listed as the immediate candidates for export among the crops currently produced in Timor-Leste. In fact, Timor Global, a trader based in Dili, has airlifted herbs to Singapore, and could divert them to Japan if so demanded.

In order for Timor-Leste to become able to export herbs and spices to Japan, it is imperative to improve skills in cultivation and processing. From the beginning, besides learning processing techniques, farmers need to change the way of thinking so that they would see the importance of quality control.

There are challenges faced by the export sector itself. Facilities for packaging and transport need to be improved. Only CCT imports and uses small bags and boxes for retail. For other crops, packaging in Timor-Leste does not exist.

B) The Transportation from farm lands to the seaport

In the case of coffee beans, the collection, the measurement of the quantity, and its transportation to the capital city are arranged by exporters. They deliver product by their own trucks, or outsource it to individual small trucking companies.

Coffee beans collected to a warehouse in the capital city are loaded into a container after the inspection and packing processes. The container is delivered to the port by a forwarder.

The roads to be utilized for the inland logistics consist of the west-east main road in the northern part of the country and the south-north main road which goes over the mountains. In this situation, the route 1, which stretches away from Dili to Baucau, is under the maintainance by the support of JICA. And the main roads to the southward and the westward have been maintained by ADB (the Asia Development Bank) and other donors. Especially, the north-south roads are paved but their conditions remain inadequate. Therefore, sways and trembles by the curves and bumps in the roads cause defects of the fresh products. Also, landslides in the rainy season prevent the local farmers to access to the market.

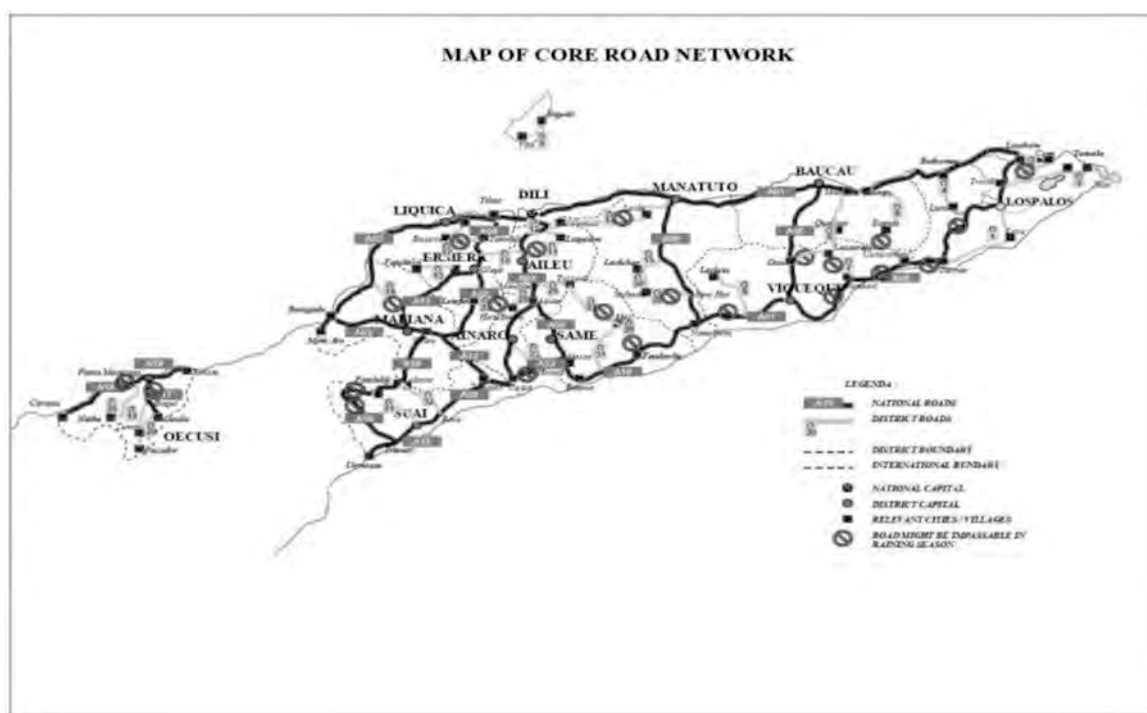


Figure V-3 Road network in Timor-este

(Source: Report of the Project for Promotion of Agribusiness in Timor-Leste)

With regards to the infrastructure, the well-organized south-north roads are necessary for the distribution of the fresh products throughout a year, and for keeping their quality.

C) Equipment of packaging

The packing materials are not produced in this country. All these materials are imported. Hemp bags for coffee beans are imported from Bangladesh. And paper and vinyl bags for domestic for coffee products, from Indonesia.

D) Equipment of harvesting

The agriculture remains in the primitive stage in this country. Most processes are not mechanized and rely on man-power. Almost all the tools used for harvest are imported by Chinese and Indonesian traders, who are running shops in Dili.

On the other hand, MICE has provided a few refrigerated trucks to some farmers, some parts of vinyl house by the donors, and some measurements by a few enterprises.

E) The flow of the logistics

After the exporters like ATJ or CCT deliver the purchased coffee beans to the capital city, packing, custom clearance and quarantine processes follow it. Finally, a forwarder brings the container to the seaport to process the necessary export processes. It takes approximately one month to reach the goods.

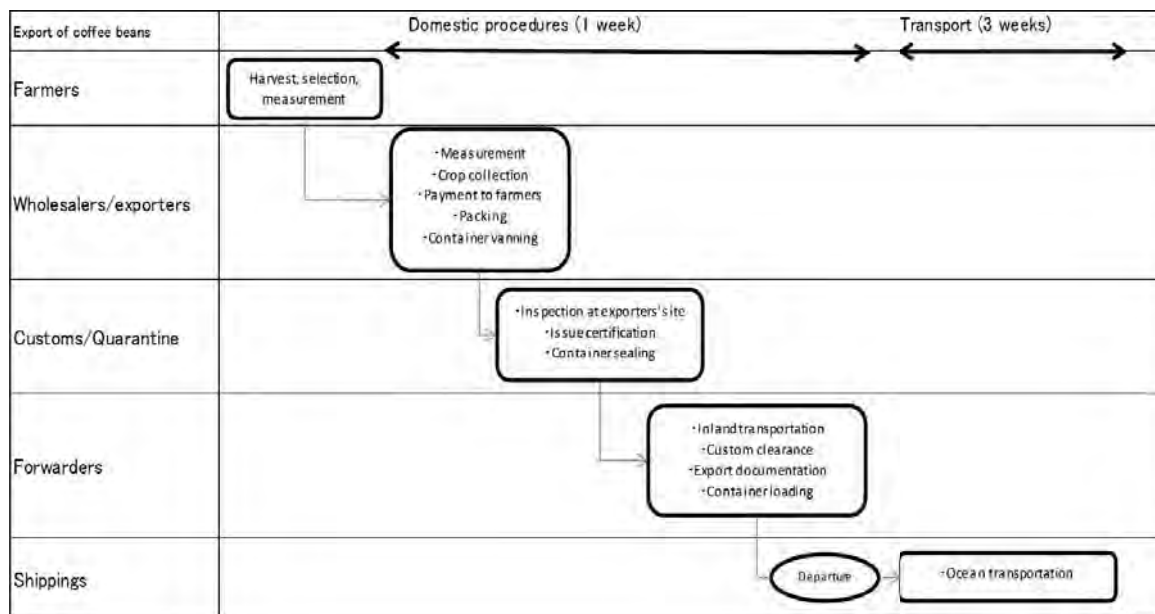


Figure V-4 The export flow of coffee beans

F) Quarantine

The headquarters of National Directorate of Quarantine and Biosecurity (NDQB), under the Ministry of Agriculture and Fisheries, is located in the Dili Airport. 76 staff are working for the Directorate's offices at major subdivision cities. A laboratory is located in Comoro area with 3 permanent staff.

The current NDQB system does not comply with the quarantine systems of WTO or ISPM (International Standards for Phytosanitary Measures.) The Directorate is now working for implantation of ISPM with technical support by Indonesia.

Current exporting products from East Timor are very limited such as coffee, copra, candlenuts, teakwood and etc. Inspection over those products is only done by visual check to find pests, and they do not conduct inspection in order to fulfill the requirement of importing countries. Under the current resources, they recognize that the challenge would be strengthening skills and knowledge of staff members, and enhancing inspection equipment in the laboratory.

Three staff members work in the laboratory in Comoro zone. Australian staff periodically visits there to give a technical training. This lab is prefab, and the entrance door remains open. In addition, goats are staying around the building. According to one of the staffs, the lab faces problems in the lack of the number of staffs, technical training, and the better equipped circumstance.



A door leading to the lab.

V.2.4 System status

A) Quality approval

There is no public organization who deals with the quality licensing. MAF quarantine and former Ministry of Tourism, Commerce and Industry (MTCI) had been discussed necessity of the establishment of an organization for SPS improvement, but it hasn't yet been realized. This history is already known to the private sector, such as Timor Global and Kmanek supermarket. They also recognize the poor SPS level as a bottleneck in the export development. On the other hand, no one in this country could be a specialist to be in charge of this field.

B) Land Ownership

Land ownership takes three forms in accordance with the newly installed regulation, namely, private, public, and government owned. Presently, land can be categorized into the lawfully owned and the customary owned ; the latter includes land use right and community-owned. The process of claims on property is confusing due to the complexity of Timorese history and an applicant may use the items listed below as the proofs of land ownership: 1) based on local customs, 2) certificates issued by the Portuguese ex-colonial authority, 3) certificates issued by the Indonesian authority before Timorese independence, and 4) other types of vested long-term land use right. This complexity delays establishment of an effective land ownership system (JICA, 2011).

Supported by the donors, the National Directorate for Land, Property and Cadastral Service claims that it has gained a capability to process applications for land ownership certificate in urban areas. However, in the reality, the cadastral regulations are not functioning even in the capital; due to confusions passed on from three different eras. There are very difficult cases to determine the owner of certain property. It is worse in rural areas that the majority of farmers do not have any land certificate, or ones issued by the Indonesian authority at best. Farmers with no land certificate ought to stay close to their property lest new settlers might squatter in their property.

Because land owned by a farmer can be used as collateral, land ownership often defines farmers' access to credit market. Hence, land ownership system is closely linked with agriculture banking system. It is imperative to establish reliable land ownership system in order to assist in promoting commercial farming.

V.2.5 Current situation relating to human resource development industry

A) Difficulty on the production and cultivation techniques

When it comes to promotion of export-oriented primary industry, it is essential to maintain both quality and quantity of selected commodities in order to establish good reputation as a reliable supplier. Should the selected commodities be currently produced in Timor-Leste, no matter how small quantity, it would be a good start because improving such commodities is normally easier than introducing new ones. In order to induce improvement, farmers need to learn new techniques and management skills, and promoters and/or investors should correctly estimate for the size of prospective leap in skill level, and then, select commodities to promote, accordingly.

Although the current Timorese agriculture is organic by default, in order to achieve high yield, farmers need to learn new techniques.

This underdeveloped state in terms of infrastructure raises transport cost, and, in turn, hinders agribusiness. Not only infrastructure, shortfall is troublesome in terms of knowledge and experience; the study also pointed out that existing distributors showed great weaknesses in management and that little information on agriculture and market reaches farmers. For these constraints, it is difficult to consider those agricultural products that require storage in site or prompt delivery for export.

Our investigation revealed, for spices and non-essential commodities, the preprocessing levels of Timorese farmers were very primitive, which indicated currently farmers could not meet the required qualities for exporting the products to Japan. Timor Global's story depicts this problem vividly; no matter how many times Timor Global asked the farmers to carefully sort out debris from cloves, there were so many of them that Timor Global has to sort again, by themselves.

Final quality/size inspection is always done by wholesalers because of poorer interest in quality on the farmers' side.

B) Agricultural extension workers

The extension of the agriculture is dealt in the MAF, DNADC. This department consists of the three sections, which are the community development, the extension, and the public relation. It disposes large number of the extensionists in the district level under the governmental policy.

According to the department, there is one senior extensionists in each 12 districts. And 376 of them are allocated in the suco level. They are staff members of MAF, supporting rural farmers by giving technical trainings.

An extensionist in Baucau manages PDCA based on the annual target of harvesting quantity in each Suco. The World Vision provided seeds and gave him technical trainings. GIZ provided a motorbike, and JICA did notebooks. Some trial cultivations have been implemented in a Demonstration Farm.

He faces shortages in some hardware like GPS, tester, camera, and in opportunity to learn the necessary skills for giving trainings beyond his specialty.

C) Agricultural education institutions

< Agriculture Vocational School >.

MAF has three high schools as a part of the agricultural education system.

Natarbola (Mantoto) ···· 270 students, 64 beds in dormitory

Mariana (Bobonaro) ···· 258 students, 56 beds in dormitory

Firoro (Lautem) ···· 150 students, 140 beds in dormitory

About 200 graduates start their new carrier annually after 3-years study. The curriculum is consist of the basic courses and the general agricultural courses which include crops, livestock, fishery, forestry and farmers' grouping. Each school has his own dormitory to support the students' convenience.

Since September 2006, USAID has started a program of the teachers' capacity building in agricultural education (BACET). In that program, experts in the field of a cooperative system and the dairy are providing the one-year educational course. Within this program, a course deals with the procurement of equipment. It is remarkable that a course deals with the capacity development of teachers by practicing the forming of a cooperative and OJT in CCT.

The Study Team visited Don Bosco Agriculture Vocational School in Lautem to get a picture of agricultural education. This school was founded in 1948. This school is one of the three existing Don Bosco schools in Timor-Leste and the school is specialized for agriculture. There are 20 teaches at the school and most of them are educated in Indonesia with agricultural techniques, and there are 11 staffs for support operation. Accumulated graduates are approximately 1,000 by now and most of them got back to their farming land and others are working for the government for example MAF extensionist.

Six years of primary and three years of pre-secondary graduates are eligible to join the school. The students study for three years, and they learn agriculture, horticulture, livestock and fishery, and English as common cubiculum, then they will study specialist course. They study in the classrooms in the morning and in the school farm in the afternoon.

The standard number of students is 50 per grade and there are 145 students with 1/3 of female students now. There are 100 hectares of land including facilities and farming lands but not all the farming land is in use. They grow corns, soy beans, long peas and cabbages and they cook them for their catering and livestock food, they do not sell them at market.

There are several facilities in the premises such as dormitories, church, classrooms, laboratory, and library. Interior and exterior of the facilities and the farming lands are maintained clean and neat by the students. There are minimum equipments in the laboratory which allows the students to do basic experiment but it would be not enough for inspections and data collection due to the lack of equipments. There are limited numbers of book stocks in library and it would not be good enough for research.

The school is operated by supports from foreign donors such as renovation over the facilities, and tractors and other heavy equipment by USAID, project support by Australia, New Zealand, Canada

and Brazil. The school has some problems in operation. The biggest one is fence or wall need to be separated from other properties because animals from the outside come in and eat all the vegetables one night. Other problems are inappropriate irrigation, lack of equipments at laboratory and lack of books at library. The school is one of the authorized agriculture vocational schools by the government. Judging by the collected information and the existing facilities, the school can provide proper education for fostering farmers and extensionists. In consideration of exporting the agricultural products to outside of the countries, however, it would not be good enough to develop human resources who can handle SPS inspection, quarantine or analysis of component of products.

< National University of Timor-Leste >

The national university has 1,457 students in 7 courses. The agricultural department contains the courses like the agricultural economy, the agriculture, the livestock. The university does not have a training facility of food processing, so it prepares the practicing class with the cooperation of a NGO. At present there are 42 professors and temporal teachers.

The graduates play important roles in the future agricultural sector, agri-business above all. And it is necessary to give a capacity building to those teachers first of all. The university will challenge in the collaboration with private sectors, and promotion of exchange with foreign human resources.