"Needs Survey" under the Governmental Commission on the Projects for ODA Overseas Economic Cooperation in FY2012

Summary Report

Lao PDR, Sri Lanka, Rwanda

Survey on Needs for Assistance in Agriculture in Developing Countries by Using Techniques Developed by Small- and Medium-Sized Enterprises

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This report is a summary of a needs survey conducted by the contractor, under the Governmental Commission on the Project for ODA Overseas Economic Cooperation, commissioned by the Ministry of Foreign Affairs of Japan in Fiscal Year 2012. It does not necessarily represent the official views of the Ministry of Foreign Affairs of Japan.

Summary

1. Overview of the Countries Surveyed and the Identification of the Needs for Assistances

1.1 Lao People's Democratic Republic

In spite of its being an agricultural country with more than 70% of the population living on farming, Lao PDR's food products are not competitive in the international market. Laos needs to import a significant amount of vegetables, fruits and processed foods from Thailand, China and Viet Nam to cover its national demands.

In the Lao agricultural sector, chemicals and fertilizers are insufficient and competitive varieties are few. The Government considers its important to promote the exportation of organic rice, fruits and vegetables. In particular, the Bolaven Plateau in southern Laos is an appropriate area for organic farming with relatively cool climate and fertile soil, and is producing cabbages as an important agricultural item exported to the neighboring Thai market.

Most food companies are small and medium-sized and are processing their products mostly by hand work. Few companies are competitive enough to export their products, but some tapioka strarch producers in Champasak Province are highly motivated in exportation.

1.2 Democratic Social Republic of Sri Lanka

Although Sri Lanka is experiencing a rapid economic development after the end of the 25 year-long civil war, agriculture continues to be the most important economic sector of the country as the result of delayed development of its socio-economic infrastructure. Its internationally competitive agricultural products are, however, limited to some plantation products such as tea, rubber, coconuts as well as Sri Lanka-native spices, while the national demands for rice as staple diet and vegetables are covered by the imports from India, Pakistan, Bangladesh, Thailand and China.

The harvest and processing of plantation crops are largely done manually. Therefore oncoming labor shortage is regarded as a limiting factor in the agricultural sector.

Most processed foods sold in retailers are produced by multinational companies, while the proportion of domestic products is low.

1.3 Republic of Rwanda

Rwanda is an agricultural country with more than 60% of the population living on farming. Its food self-sufficiency has been achieved on the calorie basis. However, the demands of sugar, wheat and rice as well as other processed foods are covered through importation.

As a member of the East African Economic Community, Rwanda has business chances derived from the significant regional trade. On the one hand, its being a landlocked and hilly

country and its mostly small-scaled farmers make Rwanda's agricultural products and proceed foods less competitive than the neighboring countries in terms of their prices and quantities. On the other hand, the country's stable and mild climate (the average temperature is 25 degrees C throughout the year) and volcanic thus fertile soil are good environmental conditions for the production of high-quality agricultural items.

There are a number of enterprises considering to produce high-quality goods by improving the value-chain and food-processing machinery now in use.

2. Analysis of products and technolotgies posessed by Japanese small and medium-sized enterprises

2.1. Needs for products and technolotgies possessed by small and medium-sized enterprises

The survey team considered what and in which subsector they should improve in order to achieve the largest development in the given agricultural sectors of the three countries surveyed and analyzed the *critical points* which are defined as "what to be improved to lead to the development of the agricultural sector as a whole most effectively". The critical points identified for each of the three countries surveyed and the technologies and materials needed are summarized in the table below.

2.1.1 Lao PDR

Critical Point	Technologies and materials needed
The performance of the centrifuges currently used for the tapioca starch purification is low, and therefore the yield rate of tapioca starch is as low as 20 % (normally 25%).	Starch centrifuges Peripheral equipment (washing, crushing, and drying equipment)
Leaf vegetables such as cabbage and Chinese cabbage are transported to the Thai border without packaging and cooling, causing qualitative degradation, significant disposal, and lowering prices of the products.	Vacuum refrigerator for pre-cooling.
Although Lao PDR has cool areas adapted for the production of vegetables strongly demanded in domestic urban areas and neighboring countries, there is no production of such potentially-demanded vegetables as turnips or *komatsuna*.	Japanese vegetable seeds and materials adapted to the Lao local climate and soil
The production of non-glutinous rice is increasing, but insufficient rice polishing facilities allow the contamination of a lot of husks and broken rice grains in	Rice polishing machinery adapted to long-grain rice. Separators according to the length and color. Polishers.

the final products, resulting in a low quality.	
Although the production of leaf vegetables such as cabbage and Chinese cabbage is flowering, lack of processing technology does not allow the value-adding and the use of surplus.	Vegetable drying machinery.
For the stable production of organic vegetables throughout the year, it is necessary to improve the infrastructure, especially vinyl houses for the protection against rain and sprinklers. Currently farmers do not have not sufficient financial resources to introduce them.	Vinyl houses for vegetable cultivation (against rain). Sprinklers and associated facilities.

2.1.2 Sri Lanka

Critical Point	**Technologies and materials needed**
The lack of labor has become a serious problem for the harvest in tea plantation	Mechanization of harvest by introducing for example a device (machine) to harvest selectively two leaves and one bud
70 % of tea bushes are now too old and need to be replaced by new varieties adapted to climate change.	Introduction of effective grafting technology to produce an enough number of tea plantlets to facilitate the introduction of new tea varieties
Lack of trained laborers for collecting latex	Introduction of an improved device which could be used by untrained laborers
The decrease of trained laborers has become a serious problem for the existence of the cinnamon industry.	Mechanization of the process of rubbing (process of rubbing the young shoot to facilitate the removal of bark)
The improvement of quality of powder such as rice flour and spices	The introduction of grinders and contaminants remover

2.1.3 Rwanda

(3) Rwanda Critical Point	Technologies and materials needed
Production of cassava flour	Introduction of grinder
Packaging of food such as macadamia nuts, cassava flour, etc.	Packaging machines/printers for the production of food labels

Import substitute of plastic bottles for drinks (introduction of facilities to produce plastic or pet bottles)	Facilities to produce PET bottles
Rationalization of the value chain through the introduction of distribution centers equipped with refrigerators and processing facilities	Storage facilities equipped with refrigerator necessary for pre-cooling of vegetables and fruits and cooling of milk products
Promotion of the production of macadamia, avocado, orange etc. by the mechanization of grafting of plantlets	Introduction of grafting machines for the production of relatively large plantlets such as those of macadamia

2.2 Environment around products and technologies possessed by small and medium-sized enterprises

The world's importation of machineries and facilities used for the value addition of agricultural products has increased by 150% over the last 10 years, while the share of developing countries among the world total has also increased. In the exports of the same categories of machineries and facilities, American, European and Chinese companies are the main players and Japanese manufactures' role is limited. In Japan, the agricultural-product processing machine and facility subsector is mainly composed of small and medium-sized companies and is a typical domestic-market oriented industry with little foreign trade. Nowadays the domestic market is shrinking as a result of the lowering of the birth-rate and the aging of the society, and therefore the industry is looking for emerging markets in Asian and other countries. However, only medium- and large-scale companies establish oversea offices to extend their business in foreign countries.

Moreover the world's import of seeds has increased by 160% over the last 10 years, while the share of developing countries among the world total has also increased. Netherlands, American and other European countries play important roles and Japanese companies are minor players in the exportation. The Japanese seed industry is composed of small and medium-sized enterprises and is working mainly in the subsector of vegetable and flower seeds. In this subsector the contribution of the Japanese seed industry is not small. Japanese companies' seed production is moving from Japan to abroad and is considered to fulfill the domestic demand by seed produced abroad.

2.3 Overview of similar companies, products and technologies in foreign countries

Europe-based multinational companies have a large share in the global market of food processing facilities and machines. They overwhelm Japanese companies by their wide product lineups, comprehensive service provisions, and huge capitals. On the other hand, products made in Asian countries such as Taiwan and China are still problematic with respect to their robustness and

maintenance services, thus they cannot enjoy the merits derived from their relatively low price in comparison to Japanese products.

A high share of the world seed market is occupied by European and American companies, in particular by ones originated in pesticide business of large chemical companies. They are working mainly on cereal seeds but are also embarking on the businesses of vegetable, fruit and flower seeds. In these subsectors Japanese companies are competing fairly well with those Western majors with the competitive edge of possess highly sophisticated abilities in developing new varieties.

3. Analysis on the potential utilization of Japanese small and medium-sized enterprises' products and technologies in ODA projects

3.1 Japanese small and medium-sized enterprises' products and technologies applicable to development problme solutions in developing countries

The table below shows Japanese small and medium-sized enterprises' products and technologies, which are expected to be utilized to solve development problems in developing countries in question, with examples of leading companies.

3.1.1 Laos

Products and Technologies	**Leading small and medium sized enterprises (location of the headquarters)**
Vacuum pre-cooling facilities	Narasaki Sangyo Co., Ltd (Chuo-ku, Tokyo)
Packaging film	Belle Green Wise Co., Ltd. (Nagoya-shi, Aichi)
Dryer facilities	Sanshu Sangyo Co., Ltd. (Kagoshima-shi, Kagoshima) Yahiro Sangyo Co., Ltd. (Minokamo-shi, Gifu)
Rice polishing facilities/machines	Taiwa Seiki Corporation (Toyoma-shi, Toyama)
Agricultural production material such as vinyl houses	Satoh Sangyo Co., Ltd (Umi-machi, Kasuya District, Fukuoka)
High-performance centrifugal separator	Saito Separator Limited (Ota-ku, Tokyo)
Japanese high-quality varieties	Mikado Kyowa Seed Co., Ltd. (Shibuya-ku, Tokyo)

3.1.2 Sri Lanka

Products and Technologies	**Leading small and medium sized enterprises (location of the headquarters)**
Device to eliminate contaminants	Seiho Co.,Ltd (Tatebayashi-shi, Gunma)

Grinder	Makino Mfg. Co.,Ltd（Katsushika-ku, Tokyo）
Tapping knife	Sanjo Industrial Cooperative（Sanjo-shi, Niigata)
Dryer	Sanshu Sangyo Co., Ltd. (Kagoshima-shi, Kagoshima)
Tea harvesting machine	Ochiai Cutleay Manufactureung Co.,Ltd. (Kikugawa-shi, Shizuoka)
Wood working machinery	Japan Woodworking Machinery Association（MInato-ku, Tokyo）

3.1.3 Rwanda

Products and Technologies	**Leading small and medium sized enterprises (location of the headquarters)**
Packaging machine	YUKI Co., Ltd (Kawaguchi-shi, Saitama)
Grinder	TOKUJU CORPORATION (Hiratsuka-shi, Kanagawa)

3.2 Proposals for ODA Projects utilizing small and medium-sized enterprises' products and technologies and their contributions to the solution of the *critical points*

On the basis of the survey, the survey team proposes the following new ODA projects with consideration of the projects' contribution to the solution of the *critical points*:

3.2.1 Lao PDR

Proposed new ODA projects	**Activities**
Enhancement of the productivity of tapioca starch by introducing a high-performance centrifugal separator	It is proposed to provide technical assistance in model project for the purification of tapioca starch with a high-performance centrifugal separator and to provide a soft (transfer of technology, training) and funds (needy equipment and fund for model project) for Champasak Province Chamber of Commerce and Industry Bureau.
Improvement of market competitiveness of leaf vegetables produced in the plateau by improving the value chain after harvest	It is proposed to construct a pre-cooling facilities with the storage function in the leaf vegetables producing areas in the Bolaven Plateau and to organize training courses on the packaging of fresh vegetables
Cultivation of high-quality vegetables by introducing Japanese high-quality varieties.	Firstly, it is proposed to select appropriate varieties in cooperation with the Agriculture Research Center and with the participation of interested farmers and to consider the most appropriate cultivation methods. Secondly, it is

	proposed to organize trainings for the selected varieties to be cultivated widely by farmers.
Improvement of rice quality and strengthening of export competitiveness through the improvement of post-harvest management for rice	It is proposed to provide technical assistance in model project for rice polishing with a high-quality rice polishing machine and to provide a soft (transfer of technology, training) and funds (needy equipment and fund for model project) for Champasak Province Chamber of Commerce and Industry Bureau. It is also proposed to organize training on the operation and maintenance of the high-quality rice polishing machine introduced.
Rationalized utilization of leaf vegetables produced in the Plateau by introducing a drying facility used after harvest	It is proposed to construct a drying facility in the leaf vegetable producing areas of the Bolaven Plateau and to study the appropriate drying techniques, commercialization and marketing with a view to value adding to locally produced vegetables and fruits. It is also proposed to conduct training for the human resource development for the operation and maintenance of the drying facility constructed.
Promotion of organic agriculture through the introduction of necessary infrastructure at the individual famer level.	It is proposed to construct a model vinyl house for demonstration at the agricultural research centers and to support the introduction of such vinyl houses to model farmers.

3.2.2 Sri Lanka

Proposed new ODA projects	**Activities**
Promotion of the tea industry by introducing a selective tea leaf harvest machine.	It is proposed to support a technology development project to be jointly conducted by the Tea Research Institute of Sri Lanka and interested Japanese manufacturers for the development of a new selective tea leaf harvest machine and to organize trainings for the dissemination of the new technology.
Introduction of grafting technologies for the renovation of tea bushes with a view to the adaptation to climate change	It is proposed to introduce a new grafting machine to the Tea Research Institute and to organize trainings for the dissemination of new technologies.
Development and introduction of a new device for the collection of latex	It is proposed to support a technology development project to be jointly conducted by the Rubber Research

	Institute of Sri Lanka and interested Japanese manufacturers for the development of a new sdevice for the collection of latex and to organize trainings for the dissemination of the new technology.
Enhancement of productivity of cinnamon sticks by mechanizing the cinnamon peeling process	It is proposed to support a technology development project to be jointly conducted by the Ministry of Agricultural Export and cinnamon producers of Sri Lanka and interested Japanese manufacturers for the development of a new machine for peeling cinnamon and to organize trainings for the dissemination of the new technology.
Improvement of quality through the innovation of production technology of rice flour and spice	It is proposed to provide financial support to manufacturers of spice and rice flour to introduce a contaminant-eliminater or grinder.

3.2.3 Rwanda

Proposed new ODA projects	**Activities**
Support to the education of business coordinators promoting small and medium sized enterprises	It is proposed to develop human resources who can recognize needs of Rwandan domestic enterprises and find matching between Japanese and Rwandan enterprises. It is proposed to dispatch senior volunteers retired from trading companies.
Support to the human resource development for the maintenance of food processing machinery	It is proposed to conduct a project to develop human resources for the maintenance of food processing machines introduced from Japan
Introduction of grinder for cassava, maize, and rice	It is proposed to support switching from the use of current crusher for food product to the use of highly-effective Japanese machinery
Value adding to processed products through the introduction of packaging machines/printers for the production of food labels	It is proposed to support the introduction of packaging machines to improve current manual packaging operations, and the introduction of printers for the production of food labels to allow high quality product making.
Development of infrastructure project to establish cool (cold) chain	It is proposed to conduct survey of existing infrastructure and develop plan to build domestic distribution network of food product with those export in mind

3.3 Synagy with the on-going ODA projects

In order to implement the proposed ODA projects effectively, it would be important to seek for synergy with the on-going ODA projects conducted with the purposes of (1) developing the infrastructure such as roads to facilitate the transportation of raw materials and final products, (2) developing the electricity supply system for stable operation of processing facilities, (3) developing legal and other necessary systems for the customs clearing, (4) developing human resources with expertise in the export marketing, (5) developing human resources for the maintenance of machinery.

The proposed new ODA projects mentioned above would be better conducted jointly or in cooperation with the on-going ODA projects of "Livelihood Improvement Project for Southern Moutainous and Plateau Area" and "The One District One Product Pilot Project in Savannakhet and Saravanh Provinces" in Laos and "Project for Increasing Crop Production with Quality Extension Services in the Eastern Province" in Rwanda.

4. Business possibility utlizing Japanese small and medium sized enterprises' products and echnologies

In general, not only in the countries surveyed in this survey project, it is expected that business results of small and medium sized enterprises in developing countries through ODA projects would pave the way to business in other and similarly-situated developing countries. In many cases, small and medium-sized enterprises do not have enough resources to establish overseas offices and thus are obliged to cooperate with local counterpart companies to provide maintenance services to their clients where training is provided to such local counterparts. Nevertheless, those Japanese enterprises should play many roles including the provision of principle parts necessary for the maintenance. The fact that such maintenance-related demands occur constantly would provide small and medium-sized enterprises with new business chances. It could be further expected that local trained counterparts would become the Japanese companies' agencies, playing a role of cooperator for market development in developing countries where a small and medium-sized enterprise itself has difficulty to enter alone.

Most of Japanese enterprises having products and technologies in the field of processed agricultural products were founded and developed in regions where agriculture played an important role in the local economies. Therefore, even in the case of relatively large companies, the headquarters and factories are in many cases located in provincial cities. As Japan's domestic market is shrinking due to the decreasing birthrate, provincial small and medium-sized enterprises' finding new markets in developing countries through ODA could significantly stimulate the regional economies.

Survey on Needs for Assistance in Agriculture in Developing Countries by Using Techniques Developed by Small- and Medium-Sized Enterprises (Laos, Sri Lanka, and Rwanda)

Enterprise

- Name of Enterprise : Mizuho Information & Research Institute, Inc.
- Location of Enterprise : 2-3 Kanda-Nishikicho, Chiyoda-ku, Tokyo

Concerned Development Issues

- No value addition to agriculture product and large quantity of deteriorated products at distribution process due to the lack of cooling and packaging
- Delayed introduction of high commodity valued cultivate variety. Lack of materials adapted to local climate and soil.
- Low competitiveness of product in international market, influenced by low quality and low productivity with undeveloped processing technology.
- Difficulties of securing trained laborers

Products and Technologies of SMEs

- Vacuum refrigerator for pre-cooling, highly-functional modified atmosphere packaged, and transport equipment, to preserve freshness of agriculture product
- Package and bottles to create high added value
- Vegetable seeds of high valued variety and materials adapted to the local climate and soil
- Processing machine of agriculture product (rice milling, flour milling, contaminants remover, separator) to achieve high extraction rate and high quality processing
- Improved device which could be used by untrained laborers

Proposed ODA Projects and Expected Impact

- Construction of pre-cooling facilities and processing centers, training for popularization of technologies of freshness keeping, high valued processing, and cultivation of new variety, and financial assistance for local enterprises starting new technology introduction
- Value addition to agriculture products and improvement of competitiveness in export will highly contribute in the increase of famers income, the expansion of job opportunities in local area, and promotion of their involvement in multilateral trading system

Future Business Development of SMEs

- Emergence of demands for maintenance
- Market development in other developing countries with similar condition