

"Needs Survey" under the Governmental  
Commission on the Projects for  
ODA Overseas Economic Cooperation  
in FY2013

Summary Report

Republic of Indonesia  
People's Republic of Bangladesh  
Hashemite Kingdom of Jordan  
Kingdom of Morocco

Needs Survey on The Transfer of Japanese  
Autoclaving Food-processing Technology for  
the Reduction of Postharvest Losses

March, 2014

Hokkaido Food Industry Promotion Organization  
Dogin Regional Research Institute Co., Ltd.

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## **Abstract**

### **1. Analysis of Japanese SMEs' Products and Technologies**

#### **1-1. Conditions concerning SMEs' Products and Technologies**

Because of reduced fish harvests, declining consumption of seafood products as consumers move away from seafood, and diversification of consumer needs, competition among Japan's processed seafood manufacturers is accelerating. Because Hokkaido's frozen seafood manufacturers lead in domestic sales (1<sup>st</sup> in Japan), they are able to utilize this position to develop original technologies, such as freezing (freshness preservation) technology, technology for the effective use of unused resources, and processed foods that are easy to make. In addition, Japan's processed farm food manufacturers possess a high level of technology in new products and processes because they utilize domestic raw materials; however, they are faced with increased competition from similar and cheaper imported products. In order to compete with these imports, Japanese manufacturers are developing new products differentiated by quality, shape, and other features.

Furthermore, for many years Japan's farm equipment and machinery manufacturers have been involved in creating a crop rotation system suitable for local climates and soils, and as a result have been able to secure good yields by avoiding the problems caused by continuous cropping. With regard to sales of farm equipment, Hokkaido ranks fourth nationwide, and its companies are especially proficient in the design and manufacture of attachments for single farming machines that can be used for different crops, a need that is specific to large-scale farming. Because this sector often involves made to order products that are customized to meet the needs of users, it is difficult for the larger manufacturers to enter this field, thus making SMEs with their original technology more competitive.

#### **1-2. The Strengths of SMEs' Products and Technologies that could be Used**

Canned food, which is the most typical product made with the "autoclaving food-processing technology" in this proposal, is a mature production technology and is used around the world. However, Hokkaido's canned food production also involves both seafood and farm products, as well as managing its own technology for overall production, allowing it to better cope with the various types of raw materials found overseas.

Hokkaido's farm equipment and machinery manufacturers are developing and building products that allow large scale farmers to efficiently manage their farms. Furthermore, based on the concept of joint use of farming machinery, these companies developed a contractor business model that was the first of its kind in Japan.

Hokkaido also has many other companies that possess extensive expertise in developing and analyzing food items. Such capabilities provide them with the ability to analyze and assess the new and diversified food items that are found overseas.

### 1-3. Overview of Foreign Sector Peer Companies with Similar Products and Technologies

Canned food technology is an old technology and, technically speaking, similar levels of technology can be found around the world. It is possible to produce products of a given level by introducing a full production line. Powderization technology and mincing technology, however, are technologies in which Japan has an advantage. In the farm machinery sector, there are a few large foreign manufacturers, but because it is necessary for the company to provide maintenance and parts in addition to the machines themselves, the barrier for entry into this sector is high. In addition, expensive machines are not suitable for emerging markets, so there are cases in which even large manufacturers have found it difficult to enter certain markets.

With respect to functional food material related technology, the Hokkaido Biotechnology Industrial Cluster Forum has received a high global ranking.

## 2. Indonesia

### 2-1. Description of the Current Situation of the Concerned Development Issues in the Surveyed Country

In order to cope with its growing population, in addition to rice which is its main staple among food crops, the Republic of Indonesia (hereafter referred to as Indonesia) has set a goal to increase the yield of corn, soy beans, sugar, and beef so that certain levels of self-sufficiency will eventually be reached. To this end, the government has implemented various policies. However, with respect to corn, soy beans, sugar, and beef, it is expected that the target self-sufficiency levels will be difficult to achieve.

Therefore, of the five major crops, we have decided to focus on postharvest losses of soy beans, which are widely consumed by Indonesians and an important source of protein in the form of processed foods such as tempe and tofu. We examined the problems and needs in East Java province, which is one of the major producers in Indonesia.

Implementing the proposed projects to solve the challenges and needs in this survey is able to reduce of post-harvest loss of soybean, to increase in production volume of soybean, to reducing the dependence on imports and to increased production of rice because of the crop rotation. So, the proposal projects have a

potential to contribute the solve the challenges and needs.

## 2-2. Development Needs of the Concerned Development Issues in the Surveyed Country and Applicable SME's Products and Technologies

A study was conducted to analyze which parts of the farming, fishing and food processing industries could be improved in Indonesia to reduce postharvest losses.

The problems and needs, and the technologies and equipment necessary to solve the problems are listed in the following table.

Problems/Needs	Technologies and equipment necessary to solve the problems
Reduce losses from cracking and spilling in the soy bean husking process.	Husker
Reduce losses by adjusting soy bean water content by using drying methods that are not affected by the weather.	Dryers and drying facilities
Improve the technology to develop new strains of Indonesian soy beans to meet market needs	Cooperation with public institutions to develop new varieties
Creating large-scale farms in order to stabilize farm management.	Understanding of agricultural land usage, Mechanization required for large-scale cultivation of agricultural land, and water management(irrigation and drainage) for bulding the basis of large-scale farmland
Modernization of farming through introduction of modern farm machinery.	Tractors, farming attachments
Stabilization of farming of soy bean	Development of food processing manufacturers which is the buyer of domestic soybean

## 2-3. Analysis of the Possible Applicability of SME's Products and Technologies to the future ODA Projects

Based on the results of the studies, new Official Development Assistance (ODA) projects are proposed in consideration of their contribution towards reducing postharvest losses in the surveyed country.

In order to achieve the level of self-sufficiency targeted by the Indonesian government, we propose the introduction and implementation of farming

production technology, production control technology, and contract cultivation models that requires a comprehensive approach centering on the supply chain, as well as increasing the production (shipment volume) and introduction of various machinery in the husking and drying processes where postharvest losses are occurring. We also propose the implementation of projects for the formation of an industrial base that will lead to large-scale farms that will help to achieve stability and planned production.

ODA Proposals (New)	Overview
(1) Create a soy bean food processing business model	The production of soy bean processed food products produced in the province using soy beans as raw material (tempe and tofu), and develop and produce new soy bean products.
(2) Farm modernization model construction project	Introduce machinery and fertilizer into the 5 to 10 ha of farmland acquired for the model construction business to prove that planned soy bean production is possible, and construct a model for sustainable farm production. This farm model assumes that the system will be extended to eastern regions in the future.
(3) Large-scale agricultural technology training	Invite Indonesian agriculture related personnel to Hokkaido farms where beans are grown on a large scale, show them the high level of skills involved, and then offer them opportunities to learn the skills and knowledge necessary for large-scale production.
(4) Farming machinery maintenance training	Training for maintenance skills for the huskers and dryers introduced to reduce postharvest losses, and for farming machinery introduced for more efficient agricultural production.
(5) Create a land usage database	Create a database that is manageable for the government, as well as to comprehend the current state of land usage with an eye towards having the

	provincial government (or other local governments) consolidate farmland.
(6) Underdrain construction project	In order to facilitate agricultural production during the rainy season, construct underdrains in farm fields in order to allow adjustment of soil moisture.

The causes of soy bean postharvest losses in Indonesia were in the husking and drying processes after the soy beans were harvested. We believe that introducing new machinery in these two processes will reduce overall losses. However, because Indonesia is aiming at becoming self-sufficient in soy bean production, from the point of view of food security, reducing postharvest losses is not sufficient enough. It is necessary to assemble additional projects that encompass the entire value chain, from soy bean production to processing, and then to distribution and sales.

### 3. Bangladesh

#### 3-1. Description of the Current Situation of the Concerned Development Issues in the Surveyed Country

The People's Republic of Bangladesh (hereafter referred to as Bangladesh) is located at the juncture of South Asia and Southeast Asia. It is a moderate democratic Islamic country and plays an important role in the stability and economic development of South Asia. It has a population larger than Japan at 160 million (eighth largest in the world) in a land area only one-third the size of Japan, so that it has one of the highest population densities in the world at over 800 people per 1 km<sup>2</sup>.

Bangladesh is one of the world's least developed countries with about 50 million people, or one third of its population, living in poverty. It has many problems that must be solved, such as a need for stronger governance, incomplete infrastructure (including electricity and transportation), and better methods of coping with cyclones, floods and other natural disasters.

The food production industry and supply chain are underdeveloped, with most of the fresh food being distributed and sold in open markets. In recent years, supermarkets have been gradually increasing, but these are mostly the size of convenience stores and do not sell a wide variety of products. Agora is said to have the most supermarkets, but they currently only number about 20.

The demographics are mainly in the shape of a pyramid, but the percentage of the population under age 5 is small. This is because the child mortality rate is still high

at 4 to 5 percent, and one of the country's major problems is providing sufficient nutrition and a hygienic environment for both children and mothers. Diarrhea caused by unhygienic conditions is a common illness in Bangladesh. There are mountains of garbage everywhere, a putrid odor is in the air, and just by looking at how much food is thrown away tells the story about postharvest losses.

### 3-2. Development Needs of the Concerned Development Issues in the Surveyed Country and Applicable SME's Products and Technologies

The insufficient logistics infrastructure is one of the biggest causes of postharvest losses in the distribution stage in Bangladesh. Traffic conditions are so bad that congestion occurs each time a city center is entered, and in Dacca it can take almost an hour to travel one kilometer. In addition, the lack of storage warehouses leads to large quantities of rotting food. Another major cause is oversupply caused by concentrated harvesting within a short period. The means to solve these problems are as follows.

Problems/Needs	Technologies and equipment necessary to solve the problems
There are insufficient primary storage facilities in production regions, and the facilities that are available are poorly constructed.	Construct preprocessing factories to introduce processing technology that will allow room-temperature distribution.
Insufficient transportation infrastructure causes traffic congestion, and long periods are required to ship products to consuming areas. In addition, there is a lack of modern shipping methods, and low-grade methods of transport, such as hand-pulled carts, are used to carry products to collection points.	Construct processing facilities that do not require distribution so that products can be consumed in the regions where they are produced (local processing).
Concentrated harvesting in a short period leads to oversupply. This causes sales prices to crash, thereby dramatically reducing farmers' incomes.	Introduction of restraining and accelerating cultivation technology and contracted planned cultivation with manufacturers. Cultivation of multiple crops through crop rotation.
Losses are increased because of the dependency on distributing fresh produce.	Cultivating farm crops for processing by cooperating with food manufacturers.



### 3-3. Analysis of the Possible Applicability of SME's Products and Technologies to the future ODA Projects

Based on the results of our studies, we shall propose new Official Development Assistance (ODA) projects for reducing postharvest losses in the surveyed country based on their effectiveness.

ODA Proposals (New)	Overview
Transfer of processing technology that can make transportable products with flash high-temperature high-pressure processing technology.	Crops which perish quickly after harvesting will be produced under contract with food manufacturers so that they can be dehydrated at locations in the producing region, converting them into products that can be stored at ambient temperatures. Powderization shall be conducted during final processing, including hygiene control, by food manufacturers that specialize in this process.
Transfer potato starch processing technology and powder technology.	Process potatoes into powder using a combination of Bangladesh's spice powderization technology and Hokkaido's advanced powderization technology.
Soil improvement technology through efficient and synergistic crop rotation.	In addition to creating a crop rotation system that has a synergistic effect of maintaining the vitality of the soil, cultivate crops which are mainly imported today. This will reduce crops that have reduced quality and will give farmers new sources of revenue.
Feed development technology that utilizes unused residual produce.	Extract protein from residue created when processing farm products, and reuse it in place of fish meal.
Reduce soil and water pollution.	Conduct joint research with the Earth Environmental Sciences Laboratory of the graduate school of Hokkaido University and soil pollution improvement studies at the University of Tsukuba.

Reduce losses and improve nutrition through the development of usable materials made from farm products.	Dramatically improve the added value to farm products by introducing food health enhancing studies being conducted in Hokkaido, and improve the level of the entire value chain in Bangladesh.
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Based on the results acquired through this survey, the ODA project and medium-term business development scenarios are as follows.

With respect to proposal (1) and (2), several model areas will be selected after ODA feasibility studies for the possibility of technical transfer in model case area, and for medium-term, the transfer of improvement technologies suitable for each area will be proceeded. Then move to proposal (3), which is to effectively transfer crop rotation technology in order to stabilize soil condition which leads to continual technology transfer in (1) and (2).

The residue created as a result of (1) and (2) cannot be unavoidable. However, utilizing the residue in proposal (4) will reduce losses and increase income. Studying and developing technology of extracting feed from residue will be applied for practical use for medium-term.

Basic study will be needed for proposal (5) in order to safely conduct (1) and (2). Based on the study, the technology transfer to reduce water pollution will be done and medium term soil pollution improvement studies will be conducted.

Proposal (6) is to utilize unused resources created from crops produced in (1), (2) and (3), to study functional ingredient highly added valued by joint research team from both Bangladesh and Japan and to find such ingredients for the next few years.

#### **4. Jordan**

##### **4-1. Description of the Current Situation of the Concerned Development Issues in the Surveyed Country**

The Hashemite Kingdom of Jordan (hereafter referred to as Jordan) is surrounded by Syria, Iraq, Saudi Arabia and Israel, and therefore conditions in the Middle East directly affect domestic stability. It neighbors the Palestine autonomous region and is the country that is most easily affected by the situation in the Palestinian territories. In addition, the influx of refugees from Iraq and Syria in recent years has made Jordan a geopolitically important country in the eastern Mediterranean region.

The agricultural sector of the Jordanian economy, including distribution of

processed agricultural products, accounts for about 30 percent of GDP, and therefore plays an important role in employment, food supply, and the development of farming and nomadic herding regions. Food related industries (food processing), however, are insufficient in number, scale and planning, and are still immature industries. These issues are directly related to the high unemployment rate (12.9 percent in 2009) which represents a major problem in the country, especially among young people.

In consideration of these conditions, tomatoes were selected as the target due to the production, consumption and export quantities in Jordan and as a result of hearings held with related organizations. Postharvest losses at producers, in distribution and during processing were clarified in order to understand the issues and needs necessary to solve these problems.

#### 4-2. Development Needs of the Concerned Development Issues in the Surveyed Country and Applicable SME's Products and Technologies

A study was conducted to analyze which parts of the farming, fishing and food processing industries could be improved in order to reduce postharvest losses. In the case of Jordan, the structure of food related industries is causing a chain of losses, or in other words, there is a "lack of a value chain." An understanding of the problems and needs was gained through visits and hearings, and these problems coupled with the technologies and equipment necessary to solve them are listed in the table below.

Problems/Needs	Technologies and equipment necessary to solve the problems
Losses resulting from defective products caused by underdeveloped farms in producing regions, and insufficient selection, cold storage, and precooling equipment.	Introducing equipment such as stone pickers, tomato selectors, cold storage and precooling storage, and training farm workers.
Lack of trust between farmers, distributors and brokers.	A new type of management organization (contractors), execution of appropriate contracted cultivation.
Losses caused by the lack of freshness preserving technology in the distribution stage of fresh products.	Packaging technology that maintains freshness.
Reduced value of food processing caused by mismatched pricing and diluted awareness of detailed food production	Fundamental improvements in food processing.

that is appropriate for the food culture.	
An increased awareness of health problems caused by increased caloric intake.	Joint research concerning the search for and development of new usable items.

#### 4-3. Analysis of the Possible Applicability of SME's Products and Technologies to the future ODA Projects

Based on the results of the studies, new Official Development Assistance (ODA) projects are proposed in consideration of their contribution towards reducing postharvest losses in the surveyed country.

ODA Proposals (New)	Overview
(1) Creation of a new business, "contractors," to reduce losses of fresh tomatoes.	Transfer the management know-how of Hokkaido's farm work business "contractors" and the tomato related technology of companies to the fresh tomato production and distribution system that is already established in Jordan, and reduce postharvest losses by supporting Jordanians to create a new business model.
(2) Reduce postharvest losses by half through the construction of a tomato processing value chain.	Promote the entrance of Japan's and Hokkaido's food processing manufacturers into Jordan in order to improve the currently weak Jordanian food processing sector. Create a value chain centered on processed tomato products that can be distributed at normal temperatures in order to cope with overproduction of tomatoes, and reduce losses caused by redundancies and inefficiencies in the wholesale and retail chains.
(3) Reduce losses caused by searching for and developing agricultural usable items.	Introduce research currently being conducted in Japan and Hokkaido into improving health through food in order to dramatically improve the added value to farm products, and to improve the overall level of the value chain to reduce losses.

Based on the information acquired through the survey, the ODA projects and medium-term business development scenarios are as follows.

With respect to proposal (1), the possibility of introducing farm machinery, selectors and other equipment from Hokkaido will be examined, necessary improvements will be clarified and the possibility of establishing contractors will be confirmed, and it will be necessary to select a number of regions for feasibility

studies.

Proposal (2) will require a food processing manufacturer that is willing to consider entering the Jordanian market to establish methods for contract farming, and conduct working level studies and verification to develop processed foods that will be accepted in Jordan, upon which they will need to create a base of operations.

For proposal (3), it will be necessary to create a joint research team made up of members from Jordan and Japan to spend a number of years discovering items and making product prototypes.

Jordanian government and related officials have high expectations that Japanese-style management can take root in Jordan. The investment and authorizing agencies have made it clear that they will cooperate, so we believe that we should use proposal (2) as the core proposal, and develop proposals (1) and (3) concurrently.

## **5. Morocco**

### **5-1. Description of the Current Situation of the Concerned Development Issues in the Surveyed Country**

The Kingdom of Morocco (hereafter referred to as Morocco) is located at the cultural and trade crossroads of Europe, the Middle East, North Africa and South Africa. Its political situation has remained very stable even during the "Arab Spring," and it is highly thought of throughout the world as the entrance to Africa which has excellent potential for future development.

Agriculture and fisheries are important industries that account for 40 percent of the working population and about 15 percent of GDP. Morocco is historically known for its exports of agricultural and seafood products, which are expected to become an important means of acquiring foreign currencies. Problems exist with a high unemployment rate among the young and significant inequalities between different regions. Therefore, the government has made plans to create employment in the agricultural and fisheries sectors, and to improve the incomes of farmers and fishermen.

In the light of the detailed above, it was understood that development problems lie in improving productivity in the agricultural and fisheries sectors, therefore method for improving productivity by reducing losses and improving added value were considered.

### **5-2. Development Needs of the Concerned Development Issues in the Surveyed Country and Applicable SME's Products and Technologies**

A study was conducted to analyze which parts of the farming, fishing and food processing industries could be improved in Morocco to reduce postharvest losses.

Farm and fishery products are being distributed as fresh or lightly processed products. There is little variation of products produced from a single raw material, and added value is not maximized. Sardines, olives and tomatoes together with argan, which is attracting attention as a highly functional product, are envisioned as Moroccan products that have the highest potential, and the needs for improving added value for these products were researched.

The technologies and machinery needed to solve the problems are as follows.

Problems/Needs	Technologies and equipment necessary to solve the problems
Improving added value of farm and fishery products	<ul style="list-style-type: none"> <li>● Technologies to utilize wasted and low added value parts               <ul style="list-style-type: none"> <li>→ Technologies to extract usable substances, equipment to retrieve scales and fish skins, technology and equipment to determine freshness, technology to utilize waste liquids</li> </ul> </li> <li>● Technologies to expand the usable range of extracted substances               <ul style="list-style-type: none"> <li>→ Technology to remove fish odors</li> </ul> </li> <li>● Advanced mince production technology               <ul style="list-style-type: none"> <li>→ Frozen mince technology, mixed catch mixing technology</li> </ul> </li> <li>● Processing technology that makes normal temperature distribution possible               <ul style="list-style-type: none"> <li>→ Drying and powderization technology</li> </ul> </li> <li>● Oxidation inhibiting technology               <ul style="list-style-type: none"> <li>→ Nitrogen charging, nitrogen ice technology</li> </ul> </li> <li>● Extraction technology, uniform quality technology</li> </ul>
Measures for small farmers and fishermen	<ul style="list-style-type: none"> <li>● Technology for judging harvest timing               <ul style="list-style-type: none"> <li>→ Ripeness detectors (sugar content detectors, color meters, hardness testers, etc.)</li> </ul> </li> <li>● Technology for adjusting harvest timing               <ul style="list-style-type: none"> <li>→ Forcing and restraining cultivation technology, after-ripening technology</li> </ul> </li> <li>● Soil improvement technology               <ul style="list-style-type: none"> <li>→ Stone pickers, plows, rototillers</li> </ul> </li> <li>● Production control technology from contractors</li> </ul>

### 5-3. Analysis of the Possible Applicability of SME's Products and Technologies to the future ODA Projects

Based on the results of the studies, a new Official Development Assistance (ODA) project is proposed in consideration of their contribution towards reducing postharvest losses in the surveyed country.

ODA Proposal (in conjunction with existing ODA)	Overview
Farm and fishery product added value improvement project using the Centre Spécialisé de Valorisation et de Technologie des Produits de la Mer (CSVTPM)	Improve the added value of farm and fishery products through the development of new products and technological studies conducted by a joint Japanese and Moroccan project that utilizes CSVTPM, which provides a wide variety of food processing machinery, researchers and engineers. Also, work in conjunction with the Institut National de Recherche Halieutique (INRH) and Institut National de la Recherche Agronomique (INRA) to improve the supply system for raw materials to facilitate large scale production, and eventually reduce postharvest losses.

Based on the information acquired in this study, the scenarios for ODA projects and medium-term business development are as follows.

Morocco already has a research organization dedicated to food processing (CSVTPM). Rapid improvements for the added value of food is planned by combining existing research results, accumulated technology and experience, and existing processing equipment with technology from Japan and Hokkaido. Local people have had experience in developing new products in the past, but were not able to make the new products into actual marketable products.

Therefore, it is important that sellers of the products, both Morocco and Japanese private companies, will participate in this project. It is also important to conduct research on domestic and overseas markets' needs, set the targets for both market and products, and elucidate problems before starting project.

Plus if existing prototypes produced by CSVTPM have high possibility of being put on sale according to market needs, transferring of technology to the companies should be considered, in order to commercialize the products.

Both countries will positively solve the problems clarified in the above.

In Morocco, by creating many successful examples, utilization of food processing will be promoted. Also upgrading and improving food processing will lead to the reduction of postharvest losses. For Japanese companies, Morocco will be the entrance to develop new markets, and there will be merits such as acquiring new technology.

These efforts will lead to growth in food related industries in both Japan and Morocco.

## **Conclusion**

A total of 16 proposals for new ODA projects were made to reduce postharvest losses in the four target countries.

In addition to ODA project proposals to transfer "autoclaving food-processing technology" as mentioned in the title of this study, proposals were made for projects that involve reducing losses by constructing value chains from farm and fishery production to market development, and projects to reduce losses through the promotion of fundamental agriculture. In addition, it was clear that ODA involving research for improving health met the potential needs of some countries, and those losses could be further reduced by adding value to products. Of the three initial hypotheses, the effectiveness of "introduction of one preprocessing facility to each production region" and "contract cultivation by having manufacturers take the lead" were clearly demonstrated, and these were therefore included in most of the proposals.

The development of these ODA projects will be undertaken in the following four stages: Practical studies; verification through case studies; groundbreaking business models; and widespread development of actual businesses. Scenarios are proposed in which risks to companies are gradually reduced while investments which represent the actual risk taken by companies are increased in stages.

Given the fact that Japan is gradually transitioning from being dependent on its positive trade balance to a greater dependence on income from overseas dividends, we have made strategic proposals to improve regional income revenue in order to improve regional economies. These strategies are not based only on shipping machinery and materials, but they are also based on SMEs entering foreign markets. It is considered that an increased ripple effect will be obtained through the proposal of the "packaging of projects" throughout the 16 ODA projects, and the promotion of participation of various types of companies through "overseas development by multiple and diversified companies."



## Needs Survey on The Transfer of Japanese Autoclaving Food-processing Technology for the Reduction of Postharvest Losses (Indonesia, Bangladesh, Jordan, Morocco)

### SMEs and Counterpart Organization

- Name of SME : Hokkaido Food Industry Promotion Organization and Dogin Regional Research Institute Co., Ltd. Consortium
- Location of SME : Sapporo, Japan
- Survey Site : Counterpart Organization : Indonesia (East Java province; Ministry of Agriculture, etc.), Bangladesh (Dacca; HORTEX, DAM, SRDI, etc.), Jordan (Amman; Ministry of Agriculture, etc.), Morocco (Agadir; Ministry of Agriculture and Maritime Fisheries, etc.)

### Concerned Development Issues

- Although developing countries have some problems of starvation and malnutrition around the world, huge amount of food is not used sufficiently due to postharvest losses caused by production and distribution problems. [in the surveyed countries].
- Indonesia - Correcting domestic inequalities and modernizing agriculture.
- Bangladesh - Promoting the development of agricultural infrastructure.
- Jordan - Expanding job opportunities and stabilizing outlying areas.
- Morocco - Improving employment among the young and correcting regional and social inequalities.

### Products and Technologies of SMEs

- Introduction of sorters for agricultural production, pre-refrigerators and other equipment, and Japanese-style management (contractors)
- Packaging technology that preserves freshness
- In addition to autoclaving food-processing technology, production technology (such as drying, condensing, and extraction) used for room temperature distribution.
- R&D for new health-promoting food development
- Formulation of a "value chain" from production to processing/distribution.

### Proposed ODA Projects and Expected Impact

- Improving agricultural production technology that will reduce postharvest losses and stabilize farm revenues:
  - Jordan – Creation of a new business, "contractors", to reduce losses of fresh tomatoes.
  - Bangladesh – Reduce soil and water pollution.
- Increasing added value by transferring freshness preserving and processing technologies:
  - Indonesia – Create a soy bean food processing business model.
  - Morocco – Fishery product added value improvement project using " CSVTPM " .
- Development of new products by researching new functional materials :
  - Bangladesh, Jordan, Morocco - Joint research on health-promoting foods.
- Developing local producers and stabilizing employment by building a value chain that centralizes management from production to sales channels:
  - Indonesia – Farm modernization model construction project.
  - Jordan – Reduce losses caused by half through the construction of a tomato processing value chain.

### Future Business Development of SMEs

- Expanding sales by exporting farm machinery and transferring technology.
- Increased income and investment by developing local production businesses overseas.
- Introducing final products and promoting exports by creating businesses through joint research.

