

"Project Formulation Survey" under the
Governmental Commission on the Projects for ODA
Overseas Economic Cooperation in FY 2013

Summary Report

Republic of Paraguay

“Project formulation survey for Adding
Value to Products of Small-Scale
Farmers through the Introduction of
Sesame Processing Technology”

March, 2014

Wadaman Science Co. Ltd.

Kaihatsu Management Consulting Inc.

Joint Venture

The content of this report is a summary of the project formulation survey, which was commissioned by the Ministry of Foreign Affairs of Japan in the FY 2013 and is carried out by the consortium Wadaman Science Co. Ltd. / Kaihatsu Management Consulting Inc. It does not represent the official view of the Ministry of Foreign Affairs.

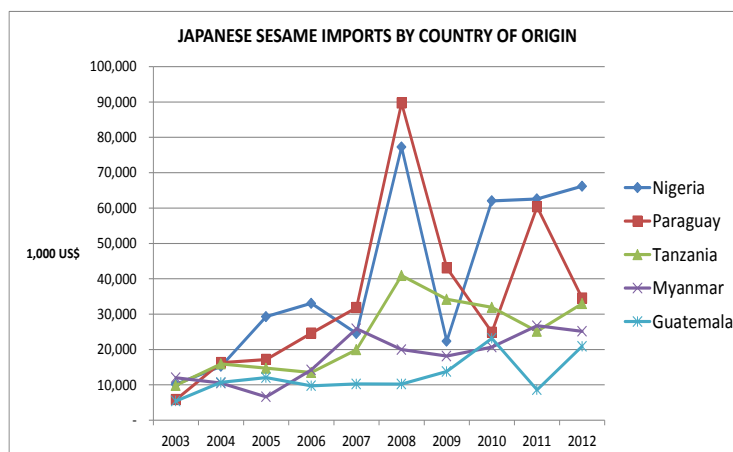
Introduction

1. Background of the Survey

Agricultural sector has been the mainstay of Paraguayan economy. The agricultural products such as soy beans, cotton, wheat, maize, sesame, beef, wood and sugar hold 90% of the Paraguayan total export, and 27% of GDP. Agricultural sector also plays an important role in the labor market; a quarter of the total population are farmers.

According to the 2008 Agricultural Census, small-scale farmers owning lands lesser than 20 ha., amount to 250,000, holding 83% of the total farmers, concentrating in the Eastern region of the country where poverty level is high. Although the main export item produced by small-scale farmers was cotton until mid-90s, sesame has become the main export item in present due to the fall of international cotton price. Sesame, as well as cotton, is considered to be a crop apt to small-scale farmers rather than large-scale farmers as it is required a scrupulous handwork.

Paraguay is the largest sesame trading partner for Japan. After 2004, Paraguay has been competing with Nigeria the first position of sesame export to the Japanese market. The existence of the Nikkei (Japanese immigrated to Paraguay), who have acquaintance of both markets, has contributed to the increase of the Paraguayan sesame to Japan.



Source: International Trade Centre

Figure 1: Japanese Sesame Imports by Country of Origin

After the export amount record of 90 million US\$ in 2008, the Paraguayan sesame export to Japan has declined drastically partly due to changes in Japanese agricultural chemical residues from negative list method to positive list method. A severe drought also affected the 2012 harvest.

2. Objective of the Survey

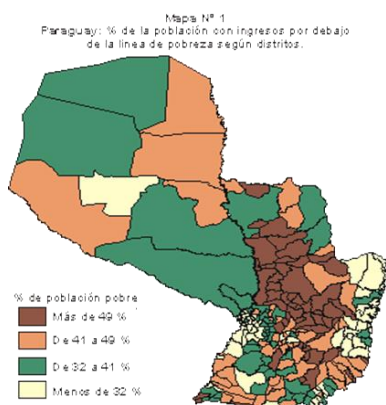
Taking into consideration the above mentioned situation, this survey aims to contribute to the development issues in Paraguay by cooperation through ODA projects, and by introducing relevant projects and technologies of the Japanese Small and Medium Enterprises (SMEs).

The proposing SME possesses sesame roasting and processing technology, and plans to settle a sesame processing factory in Paraguay to export its products to Japan and to the neighboring country, Brazil. On the other hand, Japanese Government has been supporting Paraguayan small-scale farmers in the Eastern region of the country through various projects conducted under the “Program to Support the Self-reliance of the Small-Scale Farmers in Paraguay” .

This survey aims to develop ODA projects that will introduce sesame roasting and processing technologies in Paraguay, adding value to the existing raw sesame export market and to improve the livelihood of the small-scale farmers in Paraguay.

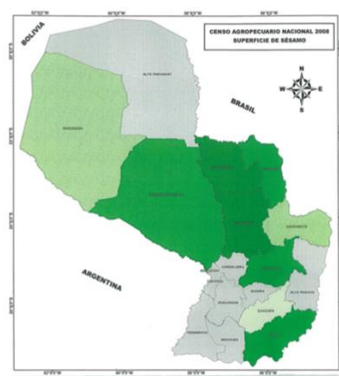
I. Description of the current situation and development needs of the concerned development issues in the surveyed country

The main development issues in Paraguay regarding the sesame sector consist on: 1) the necessity of the improvement of the livelihood of the poor small-scale farmers who are mainly living in the Eastern region of the country, and 2) the needs to diversify the selling market of the sesame produced by small-scale farmers to alleviate the vulnerability of the raw sesame market.



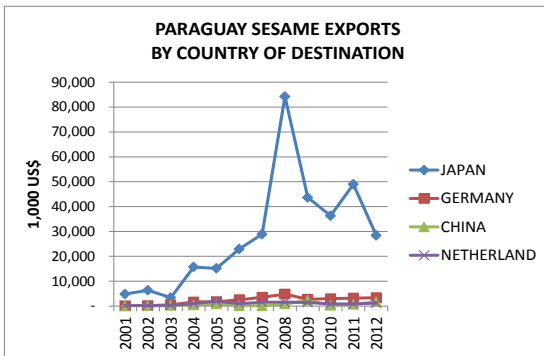
Source: Indicadores Básicos para focalizar el Gasto Social en Paraguay, DGEEC

Figure 2: Regions under poverty line



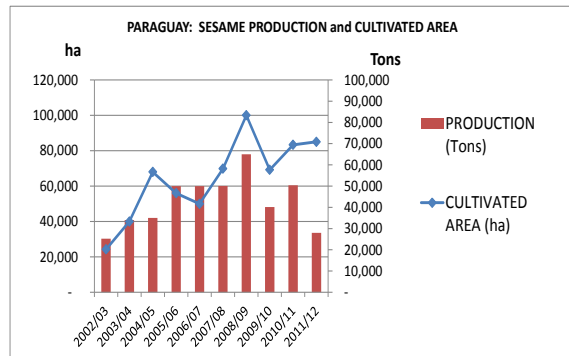
Source: Censo Agropecuario Nacional 2008

Figure 3: Regions of sesame production



Source: International Trade Centre

Figure 5 : Paraguayan Sesame Exports by Country of Destination



Source: International Trade Centre

Figure 6 : Paraguayan Sesame Production

II. Possible applicability of the SME’s products and technologies, and prospects for future business development

The business principle of the proposing SME is to “aspire world peace through sesame”, and the company has a processing technology to develop rich flavor and high functionality of sesame, and sufficient selling network inside Japan.

The strength of the technology of the proposing SME and its explicabilities are as follows:

- 1) High technology of sesame roasting, sesame processing and sesame product development: The proposing SME produces a series of sesame products of its original sesame brand “Sesame Sommeliers” and also receives orders from other brands as an OEM (Original Equipment Manufacturer). The proposing SME will be able to develop different sesame products apt to the palate of Paraguayan and Brazilian consumers, and offer sesame products to the Mercosur consumer market.
- 2) Transfer of sesame roasting techniques to the farmers: The proposing SME has been emphasized the importance of strengthening its relationship with sesame farmers, offering sesame cultivation techniques to contract farmers of the group company and promoting sesame cultivation farmers in Myanmar to produce black sesame. The proposing SME will be able to diffuse sesame toasting techniques to the farmers by acclimatizing to the food culture in the rural society, offering possibilities not only to improve rural livelihood by selling roasted sesame but also to improve the diet of farmers in rural area.

Roasted Sesame	Sesame Sugar	Sesame Soy Source	Sesame Crepe
			

* Roasted Sesame is planned to export to Japan (to the proposing SME)

* The pictures are Image pictures.

Figure 7: List of ideas of sesame products to be developed in Paraguay by the proposing SME

The following figure represents the business schedule of the proposing SME derived after observing the actual situation of cooperatives, farmers and the production, commercialization, export and consumption market in Paraguay.

Table 1: Business Development of the Proposing SME

	2013	2014	2015	2016	2017	2018	2019	2020	
Business in Paraguay	●Project Formulation Survey		●Formation of New Company	●Settlement of Sesame Processing Factory, Development of OEM ⇒Export to Japan, develop Paraguay market and export to Brazil					
				●Open Coffee Shop No.1		●Open Coffee Shop No.2		●Open Coffee Shop	
			●Cultivation test of Golden Sesame, Patent Registration (with University of Asuncion and Itapúa)	●Development of Golden Sesame Production ●Production of Golden Sesame Seedlings in Chile					
ODA in Paraguay		●"Pilot Project for Disseminating SME's Technologies to Developing Countries" Counterpart: Department of San Pedro, MAG, Agricultural High School Local Partner: La Nortea Cooperative							
Brazil				●Brazilian Sesame Market Survey	●Sesame Product Development for Brazilian Market ●Promotion in Brazilian Market	●Start Export to Brazil			
Other Countries						●Survey for the settlement of Factory No. 2 in neighboring countries			

III. Verification of adaptability of the SME's products and technologies to the surveyed country (Demonstration and pilot survey)

As part of the survey, the proposing SME implemented a component analysis of Paraguayan sesame. White sesame, black sesame and golden sesame samples were collected from Bio Export and sent to Japanese Food Research Laboratory to analyze the lignan contents. Sesamin, Sesamol, Sesamolol, Sesaminol, pinoresinol are the main lignan contents in sesame. The analysis focused on the contents of sesamin, sesamol and sesamolol.

The analysis showed that the contents of sesamin was 0.382% in white sesame, 0.31% in black sesame and 0.355 in golden sesame, relatively lower than the normal level of 0.5% . The content level of sesamol and sesamolol were also relatively lower. It is assumed that the lignan level has decreased since the samples was collected in cultivation year 2012/2013, almost after 9 months, due to the survey period did not match the sesame cultivation season.

The proposing SME plans to implement the test cultivation of a type of golden sesame not cultivated in Paraguay in cooperation with the University of Asunción during 2015-2016 cultivation season, to develop its commercialization if the test succeeds.

Table 2: Component Analysis of Paraguayan Sesame

Amount per 100 g of Sesame (%)

	Sesamin	Sesamol	Sesamolol
White Sesame	0.382	0.002	0.154
Black Sesame	0.31	0.001	0.204
Golden Sesame	0.355	0.001	0.222

IV. Expected development impact and effect on business development of the proposing SME in the surveyed country through proposed ODA projects

The proposed ODA project in this survey is “Pilot Project for Disseminating SME's Technologies to Developing Countries”. The proposing SME will offer the sesame roasting techniques to the rural area through agriculture cooperative. Specifically, the project consists in the construction of the “sesame roasting laboratory” in Santa Rosa office of La Norteña Cooperative located in the Department of San Pedro and transfer sesame roasting techniques to cooperatives, local farmers and to students of the local agricultural technical school.

Meanwhile, the proposing SME will develop its business of settling a local company in Paraguay to build a sesame processing factory to export sesame processed foods and to open coffee shop with sesame products in Asunción.

Through the proposed ODA project, the sesame roasting techniques will be introduced to rural community of sesame farmers creating a new sesame market at local level that would lead to the livelihood improvement of small-scale farmers. Furthermore, the proposing SME will buy the the roasted sesame from La Norteña cooperative, leading also to the creation of new product market of roasted sesame through cooperatives to urban and export market.

The project will attend the two development issues: 1) to improve the livelihood of the small-scale farmers, and 2) to reduce the vulnerability of depending on limited market.

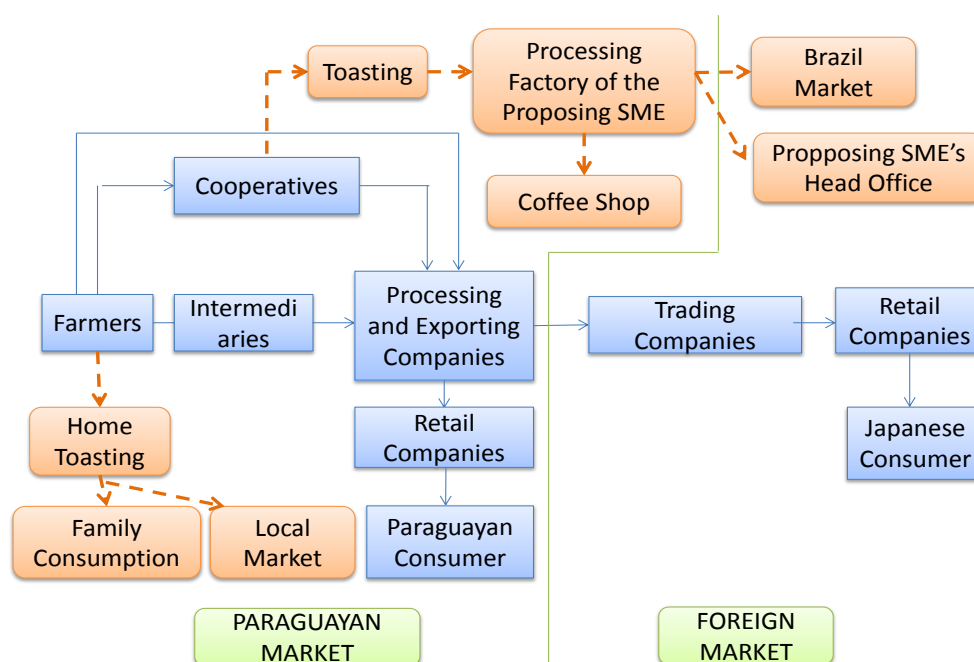


Figure 8: New markets that would be created through the Pilot Project for Disseminating SME's Technologies to Developing Countries

V. Proposals for formulation of ODA projects

The proposed ODA project, Pilot Project for Disseminating SME's Technologies to Developing Countries, consists on settling the sesame roasting laboratory to the La Norteña Cooperative's Santa Rosa Office, introducing the roasting machines, sorting machine, and vacuum packaging machine, and offering the roasting techniques to the cooperatives, cooperative farmers, local farmers, and students of the local agricultural technical school.

The main counterpart could be the Department of San Pedro. The Governor of San Pedro, Mr. Vicente Rodríguez Arévalos, has expressed his intention to cooperate to the idea of the

project by organizing a team under direct supervision of the Governor. The Governor took office recently in August 2013 under the new government of the President Cartes, willing to implement a fruitful project under his term. The Governor expressed the possibility to assume the construction cost of the sesame roasting laboratory. The equipment and machineries procured through the proposed project could be transferred to the Department of San Pedro if it is not suitable to transfer it to the cooperative.

To avoid that the beneficiaries of the proposed project would not be limited to the farmers of the cooperative members, the North San Pedro Center of Agricultural Development (CDA San Pedro Norte) of the Agricultural Extension Department of the Ministry of Agriculture and Livestock could also be one of the counterparts. The network that CDA possess with the local sesame farmers would help to open the range of the dissemination and transferring effect of the proposed project.

Furthermore, the Agricultural Technical School of San Pedro, Escuela Agrícola de San Pedro, also showed interest to participate to the proposed project. The School is located in the Department of San Pedro where poverty level is high. The school was created with the purpose to improve the livelihood of local farmers, teaching agricultural technologies to farmers' children. There are 138 students in the year 2013.

The main activities of the proposed project will be:

- a) To disseminate the sesame roasting techniques to cooperatives and farmers
- b) To disseminate the flavor and the functionality of sesame
- c) To verify the possibility of paraguayan roasted sesame as an exporting product
- d) To verify the possibility of the production of golden sesame in Paraguay

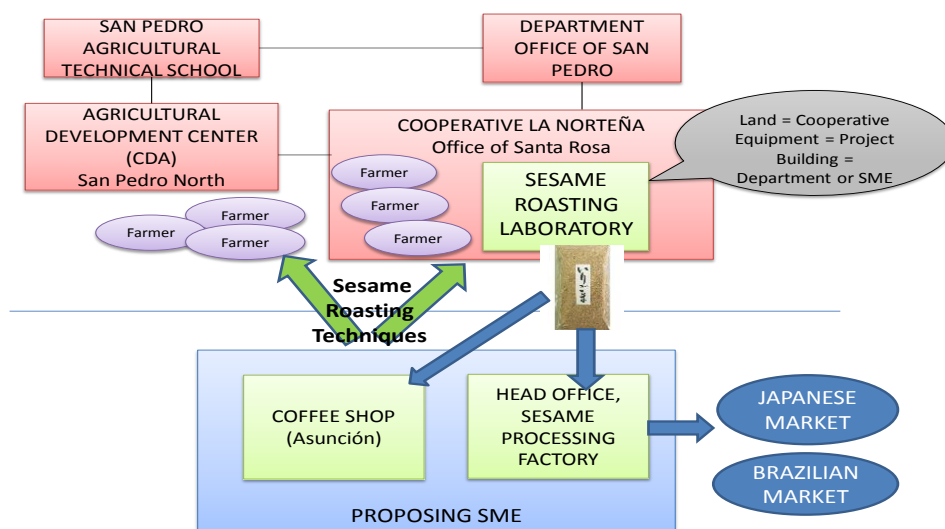


Figure 9: Concept Figure of the Proposed ODA Project

The table below illustrates the proposed schedule for the proposed project.

Table 3: Proposed Schedule of the Project

SCHEDULE	ODA ACTIVITY	SME's BUSINESS
FIRST YEAR (September 2014- September 2015)	<ul style="list-style-type: none"> • Preparation to build the Sesame Roasting Laboratory in the La Norteña Cooperative. • Preparation of the procurement of the equipment (Roasting machines, sorting machine, vacuum packaging machine). • Settlement of the equipment and machineries. • Marketing survey in Brazil. • Progress Report (September, March) 	<ul style="list-style-type: none"> • Preparation to settle the head office in Paraguay • Experiment on Golden sesame seedlings in Paraguay (Harvest result in march 2015)
SECOND YEAR (September 2015- September 2016)	<ul style="list-style-type: none"> • Preparation for dissemination activities. • March to May 2016 (After the sesame harvest season): Transfer of sesame roasting techniques, events to promote sesame in daily diet. • Survey in Chile for possibilities to introduce golden sesame seedlings from Chile developed by the Japanese seedling companies in Chile. • Progress Report (September, March) 	<ul style="list-style-type: none"> • Startups in 2016 • Preparation to settle the Coffee Shop in Asunción • Purchasing of the roasted sesame produced in the Sesame Roasting Laboratory in San Pedro. (March-May 2016) • Export of the roasted sesame to Japan.
THIRD YEAR (September 2016- September 2017)	<ul style="list-style-type: none"> • Dissemination activities concentrated in the post-harvest period (March – May 2017) • Final report. 	<ul style="list-style-type: none"> • Purchasing of the roasted sesame produced in the Sesame Roasting Laboratory in San Pedro. (March-May 2017) • Export of the roasted sesame to Japan.

The following table illustrates ideas for the specific activities of the proposed project.

Table 4: Proposed Specific Activities of the Project

Settlement of the roasting machines, sorting machine and vacuum packaging machine	<ul style="list-style-type: none"> • Six roasting machines will be manufactured locally in Paraguay. • Sorting machine and vacuum packaging machine will be imported from Japan. • All equipment and machines will be settled in the Sesame Roasting Laboratory to be built inside Cooperative La Norteña Santa Rosa. • Building of the laboratory will be built by the Department Office of San Pedro.
Transfer of Sesame Roasting Techniques	<ul style="list-style-type: none"> • Events and activities to transfer sesame roasting technique will be implemented inside the laboratory using the installed equipment. • The proposing SME will send two staffs for the instruction of the roasting method. • The instruction activities will be concentrated mainly during the harvest and post-harvest season of March to May of every year. • Sesame roasting technique will be transferred to farmers of the cooperative members, local farmers, and students of local agricultural technical school.
Dissemination of sesame flavor and the functionality	<ul style="list-style-type: none"> • Together with the transfer of roasting methods, variety of sesame dishes will be introduced. • The proposing SME will send an expert on food coordinator to Paraguay to evaluate and develop sesame dishes apt to the local food culture.

	<ul style="list-style-type: none"> • The functionality of sesame (its benefits to health) and other information regarding sesame will be disseminated through radio program offered by the Office of the Department of San Pedro.
Verification of the possibility to export the sesame processing foods to Japan	<ul style="list-style-type: none"> • The roasted sesame sorted, roasted and packed in the laboratory will be purchased by the proposing SME and will be exported to Japan to prove the commercialization of the product in Japan.

The six roasting machines is proposed to be manufactured in Paraguay. The sorting machine and the vacuum packaging machine are proposed to be purchased in Japan.

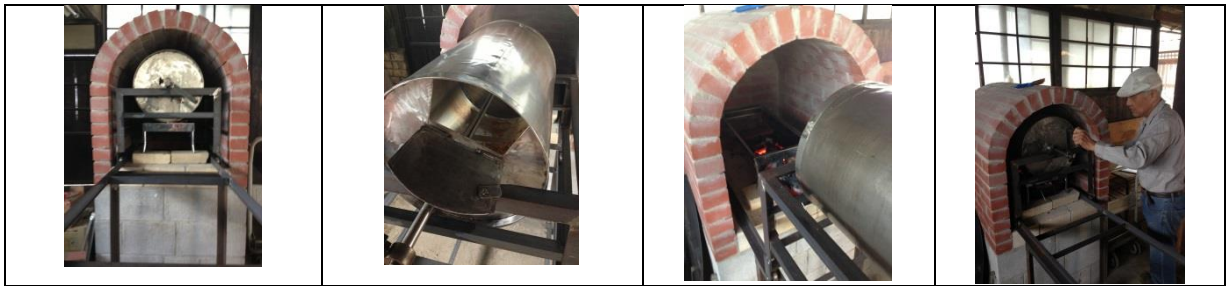


Figure 10: Image pictures of the Roasting Machine

Attachment: Outline of the survey

1. Members of the Survey

	NAME	INSTITUTION	ASSIGNMENT
1	Katsunori FUKAHORI	Wadaman Science Co., Ltd.	Leader
2	Seima FUKUMOTO	Wadaman Science Co., Ltd.	Business Plan / Investment Plan
3	Nobuo WAKITA	Wadaman Science Co., Ltd.	Roasting Technology
4	Tamayo ITO	Kaihatsu Management Consulting, Inc.	Project Manager / Development Issues (1)
5	Mika KAWAMOTO	Kaihatsu Management Consulting, Inc.	Project Coordinator/ Development Issues (2)

2. Schedule of the Survey

First Survey

NAME	ASSIGNMENT	SCHEDULE
Katsunori FUKAHORI	Leader	October 3 - October 13, 2013
Seima FUKUMOTO	Business Plan / Investment Plan	October 3 – November 6, 2013
Nobuo WAKITA	Roasting Technology	October 3 - October 13, 2013

Second Survey

NAME	ASSIGNMENT	SCHEDULE
Tamayo ITO	Project Manager / Development Issues (1)	November 7 – December 1, 2013
Seima FUKUMOTO	Business Plan / Investment Plan	November 14, 2013 – January 15, 2014
Katsunori FUKAHORI	Leader	November 28 – December 9, 2013

Third Survey

NAME	ASSIGNMENT	SCHEDULE
Katsunori FUKAHORI	Leader	January 3 – January 12, 2013
Nobuo WAKITA	Roasting Technology	January 3 – January 12, 2013

Project Formulation Survey for Adding Value to Products of Small-Scale Farmers through the Introduction of Sesame Processing Technology in Paraguay

SMEs and Counterpart Organization

- Name of SME : Wadaman Science Co.,Ltd.
- Location of SME : Kyoto, Japan
- Survey Site /Counterpart Organization : Paraguay / Ministry of Agriculture (North San Pedro Agricultural Development Center), San Pedro Department Office, Cooperative La Norteña, San Pedro Agricultural Technical School

Concerned Development Issues

- Most of the small and marginal sized farmers suffers from poverty and concentrated in the Eastern Region of the country.
- Sesami, produced mainly by small farmers and exported to Japan, are facing ship-back problems caused by residual agricultural chemicals on raw sesame.

Products and Technologies of SMEs

- The SME has high sesame processing and sesame product development technology.
- The SME promotes social activities through sesame.



Proposed ODA Projects and Expected Impact

- Through the ODA **Pilot Project for Disseminating SME's Technologies to Developing Countries** the roasting technology will be disseminated to cooperatives and farmers, leading to:
 - 1) the improvement of the livelihood of the small-scale farmers
 - 2) the creation of local sesame consumption market, and to
 - 3) reduce the risk of shipbacks and adding value to the exporting goods

Future Business Development of SMEs

- Establishment of the factory for Sesame processing in Paraguay.
- Export sesame processed products to Japan and Brazil.
- Establishment of Coffee Shop with sesame products in Asuncion, Paraguay.

