

# Terminal Evaluation

## Latin America and the Caribbean

### 1. Outline of the Project

**Country:**

Paraguay

**Project title:**

The Research Project on Soybean Production in Paraguay

**Issue/Sector:**

Agriculture/General

**Cooperation scheme:**

Project-type Technical Cooperation

**Division in charge:**

Livestock and Horticulture Division, Agricultural Development Cooperation Department

**Total cost:**

570 Million Yen

**Period of Cooperation** 1 October 1997 - 30 September 2002

**Partner Country's Implementing Organization:**

Regional Agriculture Investigation Center (CRIA)  
Other Collaborating Organization, Technical Center on agriculture and livestock in Paraguay (CETAPAR)

**Supporting Organization in Japan:**

Ministry of Agriculture, Forestry and Fisheries

**Related Cooperation:**

Project-type Technical Cooperation "Development Plan for Southern Paraguay on Agriculture and Forestry", "Main Grain Crops Production Project"  
Grant Aid

### 1-1 Background of the Project

In Paraguay, agriculture is considered to be the most important industry both for domestic needs and exports. Japan had carried out two Project-type Technical Cooperation programs in this subject area. In the first project, "Development Plan for Southern Paraguay on Agriculture and Forestry" (1979- 1988), the breeding and cultivation techniques for upland crops were established. The following projects, "Reinforcement Plan for Main Crop Production" (1990-1997), and "Main Grain Crops Production Project", focused on soybean and wheat cultivation, and enhanced the research capacities of the Regional Agriculture Investigation Center (CRIA) related to genetic resources, breeding, cultivation and soil management as well as its seed production capacity.

Soybeans are one of the most important agricultural products in Paraguay, its various processed products accounting for 50 percent of total exports. Soybeans are mainly produced in the upland cropping areas of the eastern part of the country. However, the establishment of a planting system and improvement of soil management techniques for stable productivity are important production issues; since one of the characteristics of soybeans is a different ecological response to different climate and soil conditions, there was a strong need to develop original varieties adaptable to the characteristics of Paraguayan climate and soil conditions, as most of the breeding and cultivation techniques in Paraguay were introduced from Brazil.

Under these circumstances, Japan and Paraguay agreed to carry out Project-type Technical Cooperation with the aim of "enhancing the research capability of CRIA related to breeding, cultivation and soil management in soybean production".

### 1-2 Project Overview

In order to develop cultivation techniques and original varieties of soybean that are adaptable to the characteristics of Paraguayan climate and soil condition, the Project transferred breeding, sustainable cultivation and soil management techniques to the researchers of CRIA.

## (1) Overall Goal

Stable productivity and an expansion of soybean production areas were realized through the development of breeding techniques, sustainable cultivation techniques and transfer of appropriate techniques to the farmers of Paraguay, thus contributing to the stability and development of the Paraguayan economy.

## (2) Project Purpose

The research capability of CRIA related to breeding, cultivation and soil management in soybean production is enhanced for the development of appropriate varieties and a sustainable cultivation system.

## (3) Outputs

- 1) Techniques for breeding soybeans were improved.
- 2) Cultivation techniques contributing to the establishment of an appropriate cropping system were improved.
- 3) Soil management techniques were improved.

## (4) Inputs

Japanese side:

Long-term Experts	9	Equipment	60 Million Yen
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Short-term Experts	11	Local Cost	57 Million Yen
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Trainees received	9 (two counterparts trained in the third country)		
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Paraguayan side:

Counterparts	11
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## 2. Evaluation Team

### Members of Evaluation Team

Team Leader: Shigenari KOGA, Director, Planning Division, Agricultural Development Cooperation Department, JICA

Evaluation for Cooperation/Breeding: Katsumi YAMAGUCHI, Cooperation Coordinator, Technical Cooperation Division, General Food Policy Bureau, Ministry of Agriculture, Forestry and Fisheries  
Cultivation/Soil Fertility: Hiroshi NAKANO, National Agriculture Research Center for Hokkaido Region

Planning Evaluation: Akio KAGAWA, Livestock and Horticulture Division, Agriculture Development Cooperation Department, JICA

PCM Evaluation: Wataru TAKADA, CRC Overseas Cooperation Inc.

**Period of Evaluation** 10 March 2002 - 22 March 2002

**Type of Evaluation:**  
Terminal Evaluation

## 3. Results of Evaluation

### 3-1 Summary of Evaluation Results

#### (1) Relevance

The government of Paraguay sets improvement in the productivity of primary products and increasing the value added to export products as the most important parts of its national development plan. Soybeans are considered to be a strategic product in the field of agriculture, and the government of Paraguay has launched a National Soybean Research Program (PISOJA) to increase soybean production. For stabilizing production and expanding the production area, the development of original varieties suited to Paraguayan conditions and cultivation techniques are needed. Therefore, the purpose of this project, to transfer the developed technology to CRIA, a major national soybean research institute, is relevant and in line with the national plan.

## (2) Effectiveness

CRIA has exhibited the results of Project activities through the presentation of new varieties, seminars, field trips and expositions, and the improved research capacity of CRIA is widely recognized by the University of Asuncion and soybean producers in Paraguay. The Project developed two new varieties during the project period, and CRIA gained knowledge on cultivation and soil management techniques. The increase in the scale of breeding illustrates CRIA's advances in research capability. Examples of this are the number of crossing per year has increased 2.3 times and the number of materials provided for production capacity testing has increased four times. Members of the Project shared research subjects and information with CETAPAR researchers and established a reciprocal relationship, which also contributed to achievement of the Project Purpose.

## (3) Efficiency

The inputs from the Japanese side, such as the dispatch of Long-term and Short-term Experts, acceptance of counterparts as trainees in Japan (including those trained in the third country) and provision of equipment, were conducted as planned. Allocation of counterparts for the Project was also satisfactory. Almost all counterparts remained in their posts of specialization during the cooperation period except for two who resigned. Hence, the input was efficiently utilized.

## (4) Impact

Multiplication of seeds of two varieties, "Don Rufo" and "Pua-e", developed in the Project, was started by the agricultural cooperatives. As an impact of the improvement of soil management techniques, movements which will lead to an increase in growing areas and production have emerged; in Misiones Province, where pasture-like fields are the dominant physical features of the land, the local government tested and promoted soybeans as a recommended crop for conversion from pasture. In recent years, the soybean cultivation area and production have expanded, as indicated in the table below. Although the contribution of the Project cannot be quantified accurately, the activities of the Project are considered to have worked positively to achieve these results.

The improved research environment resulting from upgrading of equipment and enhancement of the linkage with other institutions served to motivate the researchers. There were also side-effects such as the prevention of soil erosion by non-tillage cultivation.

	1997	2001
Soybean Cultivation Area	940,000 ha	1,350,000 ha
Production	2,670,000 t	3,510,000 t

## (5) Sustainability

Through implementation of the three-phased Project, which continued for 22 years, the sufficient techniques were transferred to CRIA and the management system was well-established. Hence, the sustainability of CRIA is considered as high judged from its organizational strength; however, from the financial point of view, there remain concerns about the shortage of governmental budget and CRIA's lack of authority over the usage of its own revenue sources (CRIA's own revenue from sources, such as the sale of wheat and royalties from new varieties, is consigned to the Ministry of Agriculture and Livestock (MAG)). Although CRIA has human and physical resources for self-sustainability, it needs to obtain self-authoritative revenues and a new system to make full use of them.

### 3-2 Factors that promoted realization of effects

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#### (1) Factors concerning Planning

The Project was closely related to the National Soybean Research Program and was consistent with the development plan of MAG. Hence, the Project was able to conduct activities in line with the National Program in addition to the improvement of the technical ability of CRIA researchers.

#### (2) Factors concerning the Implementation Process

- 1) Proper monitoring for the Project was carried out every six months, to ensure consistency with the Overall Goal and Project Purpose. This contributed to keeping the Project on the right track.
- 2) Both experts and counterpart personnel made efforts to maintain good communications.
- 3) Good interaction among the groups representing different research fields (breeding, cultivation and soil management) contributed to smooth Project implementation.
- 4) Proper installation of irrigation facilities minimized damage due to drought and maintained the accuracy of the experimental cultivation.

### **3-3 Factors that impeded realization of effects**

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#### (1) Factors concerning Planning

The PDM for this Project was not formed until the dispatch of Project Consultation team, approximately three years after the start of the project. Thus, the terminal evaluation team had some difficulty analyzing the Project from the planning stage through to the time of terminal evaluation.

#### (2) Factors concerning the Implementation Process.

- 1) In the area of soil management, two counterpart personnel resigned from their posts, making it necessary to repeat the technical transfer from the beginning. As a result, Project activities and efficiency were delayed to some extent.
- 2) The budget for local cost on Paraguayan side is insufficient. Moreover, CRIA has no authority over the revenues from its independent sources as these should first be consigned to MAG. The basis for making full use of transferred technology in terms of earnings potential is a concern.

### **3-4 Conclusion**

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The Project purposes are expected to be achieved by the end of the cooperation period.

### **3-5 Recommendations**

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- (1) In order to secure the financial footing of CRIA, research activities in each field should be clearly positioned within the National Policy.
- (2) Since the beginning of the Project, the Japanese side has borne most of the operational costs of implementation. The system of revenues from its independent resources should be changed so that income from seed sales and royalties from the varieties developed in the Project can be allocated to cover CRIA operational expenses.
- (3) Lining up capable and enthusiastic counterparts is the key to CRIA's success. It is desirable that CRIA continue to make efforts to improve working conditions. CRIA should also consider sending its staff to international seminars in neighboring countries to further advance their techniques and to motivate its researchers.
- (4) The technology, knowledge and know-how gained in the Project should be shared widely in Paraguay.
- (5) In order to gather research information from many sources and to develop the research capabilities of the CRIA staff, CRIA should reinforce the linkage with CETAPAR, which sets soybean as the its main area of study. Particularly, it is important to continue research on breeding new varieties resistant to soybean diseases and soybean cyst nematode. The two organizations should establish a collaborative agreement covering technical exchange and extension.
- (6) Counterparts are expected to utilize the transferred techniques in the study of new issues. The creation of a network among the researchers and organizations such as local governments is advantageous in the pursuit the research.
- (7) In the future, CRIA is expected to play a central role in the development of human resources in agriculture, with the cooperation of educational institutions such as universities and other organizations.

### **3-6 Lessons Learned**

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- (1) This cooperation, including this Project and its previous phases, has been ongoing for a total of 22 years. In the beginning, the mandate and functions of the newly established CRIA were unclear. In long-term cooperation involving multiple Projects and financial assistance, it is necessary to set an overall development plan and clarify the target area during the initial stage. This will enable effective and efficient human resources development.
- (2) CRIA has largely been dependent on the Japanese side for research funding. Without assuring its own financial resources for operations and improvement of research capacity, the technical transfers may be for naught, even though the capacities of counterparts were improved as a result of Japan's technical cooperation. It is important to carry out cooperation not only to improve the capability of researchers and research institutions but also to establish a self-sustainable system of operations.

### **3-7 Follow-up Situation**

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A Short-term expert for "soybean breeding" was dispatched from February 2003 to August 2003 to introduce measures against soybean diseases, soybean rust and soybean cyst nematode.