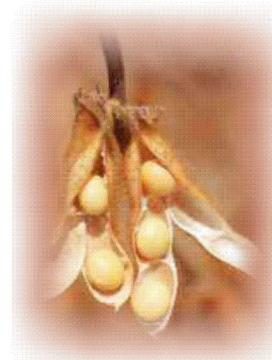




EX-POST EVALUATION

Summary



“RESEARCH PROJECT FOR SOY PRODUCTION IN PARAGUAY”

Prepared By:

- Idelín Molinas Vega
- José Buttner
- José Ibarra
- Osvaldo Peralta

In collaboration with:

- Mirna Vera



Summary

Evaluation conducted by: JICA Overseas Office

1. Outline of the Project	
Country : Paraguay	Project title : The Research Project on Soybean Production in Paraguay
Issue/Sector : Agricultural / Rural Development	Cooperation scheme : Project Type Technical Cooperation
Section in charge : Livestock and Horticulture Division, Agriculture Development Cooperation Department, JICA	Total cost : 673,487,000 yen
Period of Cooperation	August 1997 – September 2002
	Supporting Organization in Japan : The Ministry of Agriculture, Forestry and Fisheries of Japan
Related Cooperation	Technological Centre on Agriculture in the Republic of Paraguay (CETAPAR)
<p>1-1. Background of the Project</p> <p>Soybean production improvement and increased value added at local level are still priorities inside the Paraguayan Government national plan. Soybean production is considered a strategic sector within the government's development program.</p> <p>From income generation point of view, one must consider that the Paraguayan economy is the most agrarian one of South America, with approximately a fifth of the GNP (Gross National Product), coming from the agricultural sector, and soybean production as the greatest contributor.</p> <p>1-2. Project Overview</p> <p>In January of 1996, the Republic of Paraguay issued a request of Technical Cooperation to the Government of Japan, for the purpose of undertaking themes related to diverse aspects of the improvement in the soybean production in the country. In October of 1997, with the arrival of the long-term Japanese Team of Experts, the project began. The project finished in September of 2002.</p> <p>(1) Overall Goal</p> <p>“Stable productivity and an expansion of the production area of soybean will be achieved through the development of breeding techniques, sustainable agronomical techniques, and conveying of appropriate techniques to farmers in Paraguay, thus contributing to the stability and development of Paraguayan economy”</p> <p>(2) Project Purpose</p> <p>“The research capability of CRIA related to breeding, agronomy and soil management in soybean production will be enhanced for the development of appropriate varieties and a sustainable cultivation system”</p> <p>(3) Outputs</p> <p>1.- The researchers of CRIA acquire the following techniques and improve their technical capabilities</p> <p>a.- Techniques for breeding soybean</p> <p>b.- Cultivation techniques contributing to the establishment of an appropriate cropping system</p> <p>c.- Soil management techniques</p>	

(4) **Inputs** (as of the Project's termination)

Japanese side :

Long-term Expert	9 Experts	Equipment	46.891.000 Yen
Short-term Expert	11 Experts	Local cost	NA
Trainees received	11	Others	NA

Paraguayan Side :

Counterpart	11	Equipment	NA
Land and Facilities	provided by Paraguayan government		
Local Cost	1.782.702.496 local currency (___ Yen)		
Others	NA		

2. Evaluation Team

Members of Evaluation Team	JICA Paraguay Office	
	Commissioned to: Mr. José Büttner – National Consultant Mr. Idelin Molinas - Consultant	
Period of evaluation	Day/ month/ Year - Day/ month/ Year 14/October/2005 - 14/February/2006	Type of Evaluation : Ex-Post Evaluation

3. Results of Evaluation

3-1. Summary of Evaluation Results

(1) Impact

CRIA contributed to the improvement of soybean production through research on identification of new apt areas for soybean cultivation, validation of more adequate cultivation techniques and genetic improvements. It has obtained significant achievements through the development of new soybean varieties in recent years, with good performance with respect to the conditions prevailing in Paraguay and especially to the zones of intensive cultivation of soybean.

CRIA has released 4 different types of varieties since the beginning of the project, the last two being released in 2005. CRIA's varieties are being used for organic crops at small, medium and large farms. In small and medium farms, cultivation of soybean supports creating of labour force. This aspect is relevant if we consider that 47% of the farms which cultivate soybean have less than 20 hectares. However, the cultivated surface is small compared to the not-organic soybean, but looking at the smaller impacts caused to the environment and the earning benefits for the sector with smallest income (in the case of small producers), it is an alternative that deserves greater support so that the social and environmental benefits can be expanded.

Current developments and investigations on varieties tolerant to diseases, such as Soybean Cyst Nematode (SCN) and the Soybean Rust are underway with promising preliminary results. The importance of this later work is related to the rise of the diseases in three departments (states) of the country: Canindeyú, north of Alto Paraná and Caaguazú, which account for 68% of the total soybean production during 2004.

Through the analysis of available land using Remote Sensing Techniques, as well as other studies, CRIA was able to extend the cultivated area in the Department of Misiones from only 50 hectares of soybean crops at the beginning of the project to about 13.500 hectares of cultivated soybean. As a by-product of the project, in 2004 the Precision Agriculture Department was established and it is performing studies for the application of this technology in small farms, on areas such as soil acidity maps. Nevertheless, more time is necessary to have a better evaluation of the impact that this technology generates for small and medium size farmers.

An important aspect of the soil management techniques is related to direct soybean sowing on areas of native or cultivated pastures. This technique prevents from the excessive mechanization of the soil, thus reducing erosion levels and facilitating the mechanized crop. Nowadays, direct sowing is the technique applied in most of the cultivated plots within CRIA's area of influence.

CRIA has done investigations on crop rotation within the direct sowing system. One of the objectives was to substitute wheat with sunflower in the rotation plan. Currently, in all central and south regions (Misiones, Itapúa, Alto Paraná Sur and Caaguazú) the sunflower is sown within the rotation plan of direct sowing system.

Mycorrhiza fungus naturally establishes itself among the roots of the majority of plants with beneficial impacts to soils. It plays a crucial role in the plants life cycle, helping to surpass situation of stress, mainly in degraded soils. Studies on the effects of the mycorrhiza fungi for phosphorous best utilization were carried out within the project with no significant impact. The results suggested that the best effects of the mycorrhiza are in the sunflower system – soybean- or fallowland-sunflower-soybean, where greater levels of development of the mycorrhiza in the soil were observed, compared to those where another rotation plan was used (wheat-soybean or oat-soybean). The study concluded that they would have better results if the same investigation was performed in less fertility zones like Misiones, where the effect would be much stronger.

Regarding Human Resources training, 11 persons received training in Japan within the period of September 1998 and November 2002. The training was directly related to the purpose of the project. As a result of the researches performed by CRIA, 17 articles were published related to soybean improvement, during the period of 2002-2004.

(2) Sustainability

The evolution of production and the cultivated area of soybean during the last years, as well as the increasing participation of the number of producers (small, medium and large producers), indicates that the production of soybean will still be one of the most important activities in the Paraguayan economy.

Among conventional soybean varieties, the ones produced locally, including those of CRIA and other companies, have been continually losing share with respect to varieties of unknown origin and to soybean seeds farmed by the producers. This can be partially explained by the substitution with genetically modified soybean and other foreign varieties, both types introduced through increasing contraband. The constant growth of surface cultivated with genetically modified soybeans can be explained mainly due to the lower production cost as compared with conventional soybean varieties (up to 30% less according to some interviewed stakeholders). This situation affects the sustainability of the project since it focused solely on conventional varieties, which are not being demanded by producers.

Aside from the genetically modified varieties, the percentage of participation of CRIA is still low among the conventional type, having just about 5% of total share. Interviewed stakeholders stated that in some opportunities there was limited availability of seeds from CRIA, which is why producers turned to other suppliers.

Eleven members of CRIA's staff received training in Japan during the duration of the project. At the time the interviews for this report were performed, 7 of the trainees were still assigned to CRIA and only 3 are still related to the original topics of training. Among the technical trained personnel currently assigned to the improvement of soybean, only one received training in Japan and only one has university level degree. The permanency of technicians originally trained for the project and the incorporations of new professionals to CRIA is affected by the lack of assigned resources, as well as the lack of a research program which can facilitate the retention of well trained personnel. This situation is also reflected in CRIA's personnel academic background, where we find that only 14 of 78 have universities degrees in areas related to CRIA's research.

An important aspect to be considered is the generation of new research projects in association with private companies as well as local or foreign agencies. The recent experience of contribution in areas of the Soybean Rust and Mycorrhiza fungi, where funds were secured through agreements with the U.S. Department of Agriculture (USDA) and local companies, are examples of the capacity installed. This capacity should be recognized and reinforced so that it keeps fortifying the research capacity of CRIA.

The services performed by CRIA generate additional income other than those included in the assigned budget, and this could fortify the development of the competencies expected from CRIA. This will be possible only through the implementation of mechanisms that allow the return of the resources generated by CRIA to the original source (CRIA) in a proper way. This situation has already been object of analysis and request from previous Evaluation Teams and has become part of a commitment by MAG's representatives to expedite the necessary steps that allows CRIA the utilization of its own generated resources. However, no visible results can be observed.

3-2. Factors that have promoted project

There are many different factors which support the achieved level of impact, as well as to the sustainability aspects of the project. The following list includes some of the promoting factors of impact and sustainability:

- Continuous growth of cultivated area of soybean has contributed to the impact of the project in the area of soil management techniques. The identification of new areas for crops has contributed significantly to the increased in soybean cultivated surface.
- The development of new varieties adapted to different zones of the country, including areas identified through the project, produces steady yields which contribute to attractive returns for the producers. These developments reflect the degree of advancement in knowledge and technology, acquired during the project, and translate into benefit for the producers.
- Development of new varieties with good levels of proteins and oil represented an added value to commercialization of soybean. Increased international demand for organic soybean can be served with these new varieties, contributing to the project sustainability.
- CRIA's professional staff is committed to research and development. The production of CRIA has been sustained, in spite of scarce resources. The commitment of the members of CRIA is recognized by the producers, thus constituting a promoting factor for sustainability of the project

3-3. Factors that have inhibited project

Just as there are series of promoting factors for impact and sustainability of the project, there are also some factors that inhibit these aspects. Some of these factors are:

- The lack of a properly coordinated national agenda regarding the production of soybean does not facilitate neither the optimization of the available resources nor the correct channeling of concerns of the different stakeholders. CRIA's work, as related to soybean production, is perceived as not being in touch with local producers and local government needs and this inhibits the development of the full potential of the project.
- The growing participation of genetically modified varieties presents additional challenges for the sustainability of the project results since, up to now, only conventional varieties have been addressed.
- The existence of new plagues and diseases present an obstacle that must be addressed continuously. This challenge must be matched with sufficient resources in order to assure the sustainability of the results from the project.
- The achieved results in the area of soil management resulted in a comprehensive database which should be promoted among producers. This information has been shared with local governments, but further dissemination among producers is lagging behind.
- It is necessary to fortify the means of communications with producers, especially with those of the small and medium size. This communication will counteract the current situation turning from an inhibiting factor to a promoting one with regards to sustainability.
- The lack of sufficient resources assigned for the research inhibits the development of human resources and adequate use of material resources installed in CRIA. The lack of continuous training and development of CRIA's personnel seriously affect the adequate sustainability of the project

3-4. Conclusions

The new soybean varieties developed are to be emphasized, especially the last two released, Guarani and Marangatú, as products resulting from the project financed by JICA.

Innovative investigations like soybean sowing in meadowed lands and the effect of mycorrhiza fungi on the efficient use of phosphorous by plants; studies of tolerance to diseases such as Soybean Cyst Nematode and Soybean Rust, positions CRIA as a reference in the investigation of soybean in the MERCOSUR area.

Greater impact and sustainability can be expected with a superior capacity of dissemination of CRIA's developments. This will result in improvement in its promotion strategy for products developed, and in having a more efficient impact on the producers' decision making process at the time of selection of the genetic material for sowing.

The lack of availability of the resources generated by CRIA is a condition that works against CRIA's sustainability. The bureaucracy that affects the process of returning the monetary resources generated by CRIA has been object of several presentations before this work, and even of a formal commitment from the Ministry of

Agriculture and Livestock (MAG), which up to date, has not been solved yet.

3-5. Recommendations

Based on the data obtained for this report and of the analysis of them, this Evaluating Team finds the following recommendation pertinent:

- Having an Agenda for the National Investigation of Soybean that contemplates the desires and concerns of the diverse stakeholders involved in the production of soybean. This includes representatives from the producing, environmental, local, departmental, and national authorities, as well as business persons and researchers. This could be lead by the Direction of Agricultural Investigation (DIA).
- Strengthening the existing mechanisms of dissemination of CRIA's achievements focusing primarily on the communication with small producers. Publications of materials aimed at producers are a good tool. CRIA should coordinate these publications with the Direction of Agricultural Extension (DEAG) and complement this with the use of the CRIA's Internet site.
- CRIA's communication strategy for its achievements should emphasize the small producers segment (less than 20 Ha) since they represent almost half the number of producers and usually within the segment with less income. CRIA should consider implementing this recommendation through alliances with DEAG and an outside organization for the promotional aspect of its conventional varieties.
- From the institutional point of view, it is necessary that the Ministry of Agriculture and Livestock (MAG) reinforce the technical staff of CRIA with professionals qualified in research techniques and with university level degrees. The continuous shrinkage of professional personnel of CRIA can seriously damage its capacity of research and development.
- It is necessary to develop a mechanism that allows an opportune use of the resources generated. It is also important to establish their use in line with the agreed research agenda. The implementation of the terms involved in the commitment letter from MAG (included in the final report, 2002) should be monitored and enforced. The Ministry of Agriculture and Livestock (MAG) should lead the necessary changes to implement this recommendation.
- The transformation of CRIA into a decentralized unit is a pertinent proposal. This decentralization implies that CRIA with its own financial resources transferred from the Ministry of Finance (Ministerio de Hacienda), with the delegated authority to sign agreements with national or international agencies or companies or research centers, without the cumbersome procedures in place nowadays. . The Ministry of Agriculture and Livestock (MAG) should lead the necessary changes to implement this recommendation.

3-6. Lessons learnt

The lessons learned out of the analysis of the data collected in this report can be summarized as follows:

- A communication mechanism should be included in each project as a mean of promoting sustainability through stakeholders' appropriation of the project outcomes and as a strategy to continuously calibrate the concerns of both direct and indirect stakeholders.
- The presence and permanency of qualified personnel in for research works at the counterpart organizations should be considered when implementing a project. A development plan for each one of the members assigned to the project should be outlined with the counterpart, at least as a reference base.
- The environmental sustainability aspect of a project of this nature should be accounted for at the time of formulation. Proper and timely selection of environmental performance indicators should be included in the PDM