

Paraguay

Agricultural Sector Strengthening Project

Report Date: September 2002

Field Survey: July, 2001

1. Project Profile and Japan's ODA Loan



Site Map: Paraguay



Site Photo: Two-step loan: Wheat farm

1.1 Background

The Paraguayan economy is largely dependent on the agricultural sector. When this project was under planning in the mid-1980's the agricultural sector accounted for approximately 30% of the country's GDP, approximately 45% of the employed population, and approximately 90% of total exports, making growth in the agricultural sector a driving force in the economic growth of Paraguay. At the same time the economy's high level of dependence on the agricultural sector meant that the country's economy and trade balance were vulnerable both to natural conditions such as weather and to international conditions. This meant that structural strengthening of the agricultural sector was a matter of utmost importance for Paraguay's economy.

The agricultural sector at that time of project planning faced to such issues as an ill-equipped technical guidance system and a lack of agricultural infrastructure, and agricultural production was not adapting well to new production techniques, changes in natural conditions, and market price fluctuations. Additionally, as seen in delays in farm mechanization, progress in capital formation in the agricultural sector was behind. It was under these conditions that the Government of Paraguay decided in 1984 to implement the National Development Plan (1985-1989). Under that plan, the basic principle became focused development in the agriculture and forestry sectors, and defining and implementing the following specific development policies became an urgent issue: 1) expansion of farmland, 2) strengthening of the agricultural distribution system, 3) training and organization of farmers, 4) production diversification and improvement, and 5) expansion of agricultural credit.

1.2 Objectives

In order to promote capital formation in Paraguay's agricultural sector this project supplies farmers and agricultural cooperatives with funding (credit) to purchase facilities and equipment through the Banco Nacional de Fomento (BNF). Furthermore, along with that funding, the project aims to invest in the increase in and stabilization of agricultural production as well as an increase in farmer income by

strengthening the basic infrastructure of the agricultural sector such as extension, research, and distribution systems.

1.3 Project Scope

The project comprises the following components:

Agricultural Credit Project through the Banco Nacional de Fomento(BNF) (revolving fund)

Agricultural Sector Strengthening projects implemented by the Ministry of Agriculture and Livestock (MAG): (1) improvement of extension of agricultural technology and guidance, (2) development of an agricultural meteorological monitoring network, (3) establishment of a pest control system, (4) construction of grain storage facilities (silos), (5) establishment of a harvest prediction system, and (6) establishment of a system for animal sanitation control .

Hiring of consultants to establish a system for the project management

1.4 Borrower / Executing Agency

Paraguayan government / National Development Bank: (BNF) and Ministry of Agriculture and Livestock: (MAG)

1.5 Outline of Loan Agreement

Loan Amount	11,847 million yen
Loan Disbursed Amount	10,136 million yen
Date of Exchange of Notes	October 1986
Date of Loan Agreement	August 1987
Teams and Conditions	
Interest Rate	4.75%
Repayment Period (Grace Period)	25 years (grace period 7 years)
Procurement	General untied (consulting service is under partially untied)
Final Disbursement Date	August 1996

2. Results and Evaluation

2.1 Relevance

At the time of appraisal, the Paraguayan National Development Plan (1985-1989) gave highest priority to development in the agricultural sector. This project aims to strengthen the overall agricultural sector through a combination of various means. First, it aims to supply investment funds to farmers who are responsible for agricultural production to aid in increasing in their production and improve productivity. Second, it aims to improve every public service that supports farmers' production activities. The project is determined to be consistent with the National Development Plan as well as with the needs of the farmers who benefit from it.

In addition, while the percentage of the Paraguay's GDP represented by agriculture was steadily decreasing, it still represented 22% (including livestock production and timber) at the time of this evaluation, and the importance of the agricultural sector in the Paraguayan economy is unchanged. Moreover, in 1995 Paraguay joined Mercado Comun del Cone Sur (Mercosur), founded as a tariff union. After the year 2005, it is expected that there will be a complete abolishment of regional tariff barriers as

a result of comprehensive trade liberalization. Therefore, this project is still valid in its aim of improving the productivity and strength of one of Paraguay's staple industries, the agricultural sector. Therefore, at this evaluation, validity of the project is deemed to be high.

At the beginning of this project, the Paraguayan government had adopted a policy of intervention in distribution of grain and of price determination, but following the economic liberalization policy enacted after the country became democratized the role of government in the markets was scaled down. As a result of this policy change the priority given by the Government to the some subcomponents of this project (including the construction of grain storage facilities (silos) and the establishment of a harvest prediction system) was diminished, but as is described later in this document, due to some scope modifications, we can determine that these subcomponents remain valid.

2.2 Efficiency

2.2.1 Project Scope

This project comprises (1) Agricultural Credit (revolving fund) through the National Development Bank (BNF), (2) Agricultural Sector Strengthening projects implemented by the Ministry of Agriculture and Livestock (MAG), and (3) consulting services for overall project coordination including technical guidance and execution management.

Agricultural credit (revolving fund)

Banco Nacional de Fomento (BNF) disbursed agricultural credit under the following plan:

Table 1: Agricultural Credit Plan and actual scheme

	Plan	Actual
Eligible loan recipients	Agricultural cooperatives Farmers (individuals)	Same
Loan terms	Interest: 18% Repayment period: 12 years, including a 5-year grace period	Interest: 28%=>24%
Eligible items for loan	Farmland development, farm related facility construction, Purchase of farm equipment	Same
Loan coverage ratio	Facilities/equipment: 40-70% Machinery: 85-90% Materials: 95%	Same

Taking into consideration market interest rate fluctuations, loan interest rates to the end user was raised from the originally planned 18% to 28%, subsequently changed to 24%. Other than that, no particular changes occurred. In 1989, the market's lending interest rate in Paraguay was set at 28%, and it was not appropriate to keep the interest rate of this project as low as at 18%, and, thus its top limit was raised to 28%, and subsequently reduced to 24% considering financial situation of the country and the Bank.

Implementation of the two-step loan is as follows:

A. Loan amount

	Guaraní (millions)	Comments
Loan amount	133,261	
Yen-based loans	112,963	(¥7.3 billion)
BNF funds	20,299	

B. Number of loans and recipients

	Number of Loans	Number of Recipients (persons)
Individual loans	12,357	13,013
Agriculture cooperative loans	42	11,123
Total	12,399	24,136

C. Annual disbursements by purpose

(Unit: million Guaraní)

	Capital Investment Funds	Operating Capital	Total
1991	29,149	2,448	31,597
1992	11,374	769	12,143
1993	29,314	16,578	45,892
1994	26,207	842	27,049
1995	14,712	33	14,745
1996	1,835	0	1,835
Total	112,591	20,670	133,261

Project for agricultural sector strengthening

In general, the agricultural sector strengthening project by the Ministry of Agriculture and Livestock was implemented according to the planned scope. However, only one grain storage silo out of the originally planned six was built. This was due to the policy change calling for a diminution of the government's role in distribution system under Paraguay's policy of economic liberalization. In fact, following that, the number of silos that are being constructed and operated by agricultural cooperatives and private sector has been increasing. It seems that it is more desirable from an effectiveness standpoint that the planning and operation of grain storage be carried out at the private initiative of the parties concerned. There have been no particular problems with respect to the changes in government policy and adjustments to the scope of the project. The following describes the actual results of the each of the sub-projects to strengthen the agricultural sector:

- Extension of agricultural technology and enhancement of guidance

A training facility headquarters was constructed next to the San Lorenzo Agricultural Extension Division Headquarters. An auditorium with simultaneous interpretation equipment and seating for an audience of 100, along with a meeting room, and an administrative office were constructed. The facility was fully equipped with a print shop to create brochures and texts about the facility, and moderately priced accommodations and dining rooms for participants were set up. Although the original scope of the plan called only for the construction of the above-mentioned training facility headquarters, to strengthen regional agricultural extension training, the scope of the project was extended to include the

construction of regional training facilities in 10 of the 18 extension supervision regions that did not have such facilities.

- Development of an agricultural meteorological observation network

In order to develop an agricultural meteorological monitoring network, an agricultural meteorological center was set up in the city of Caacupe along with weather stations all across the country. Although the plan was to build 15 stations, in the end it was changed to 13 stations.

- Establishment of a pest control system

No major changes to the original scope were made. The aim of exterminating billbugs in the city of Caacupe was accomplished through the creation of a research facility with a laboratory, office, storage room, and greenhouse, along with the procurement of billbug traps.

- Construction of grain storage facilities

The Ministry of Agriculture and Livestock began planning and constructing six silos from the late 1970's. However, because of a lack of domestic financing, construction was discontinued in 1982-83. This sub-project, therefore, aimed at the continuation and completion of that construction. However, with the economic liberalization policy following 1989, the government's role in distribution system was downsized, and the construction and ownership of silos by the Government became inconsistent with its basic policies, resulting in a scaling down of the scope of the sub-project. According to the results of a survey that studied the economic and technical efficiency of the sub-project, the repair and construction of silos has been completely discontinued with the exception of one location in the Puerto Triunfo region in the drainage area of the Paraná River in Itaipu that is the main production region for wheat.

- Establishment of a harvest prediction system

As mentioned above, along with the adoption of economic liberalization policy the government's role in the market was downsized. Along with it, the role of the Distribution Division of the Ministry of Agriculture and Livestock changed; the main focus shifted from prediction of future harvest amounts to the collection and provision of information regarding current distribution amounts and prices. The plan was to purchase equipment to process and analyze collected data as well as vehicles, but considering the decrepit state of San Lorenzo's Distribution Division buildings, the scope of the sub-project was changed to build a new Market Information Department office (Departamento de Informacion de Mercado) on the same premises. The office is a three-story building that has a meeting room, library, and individual offices.

- Establishment of Animal sanitation control system

The original scope of the plan was designed with the aim of controlling the animal sanitation. However after becoming a member of Mercado Comun del Cone Sur (Mercosur) and the resulting expectation that there would be an increase in interregional trade of livestock products, the aim and design of the project were revised. As a result, quarantine and research facilities were constructed with the aim of controlling not only the health of the livestock but also the quality of import and export goods. Paraguay has always had abundant land resources and beef cattle and other livestock breeding has been very successful. Even now, livestock industry accounts for approximately 6.5% of the total GDP, and since it is a very important industry accounting for approximately 30% of the agriculture and

stock raising sector this change is thought to be a valid one that will contribute to the promotion of economic growth. As a result of the change, laboratories that were to be placed in four regions were combined into one central laboratory in the city of San Lorenzo.

2.2.2 Implementation Schedule

The timeline for construction of this project under the original Agricultural Credit Project was five years, between 1987 and 1991, and the plan for the Agricultural Sector Strengthening Project was two years, between 1988 and 1989. However, the project actually began after about a four-year delay in 1991. This delay resulted from (1) delay in approval process in the national diet and subsequent administrative procedures, as well as selection of and contract with consultancy firm, and (2) implementation of additional survey required as result of economic policy change in the country.. Delays in implementation after the project once started were mainly due to (1) the increase in the portion of domestic funds due to inflation and difficulties in ensuing budget allocation, and (2) the fact that most of the Agriculture Sector Strengthening Projects implemented by the Ministry of Agriculture and Livestock required longer time than the planned during the procurement phase. There was time interval of one or two years between completion of bidding documents to the actual start of bidding for each procurement lot, such as silos and the equipment and vehicles, resulting in an overall delay.

2.2.3 Project Cost

Planned and actual costs by component for the project are as follows:

Table 2: Project Costs (Unit: million yen)

	Planned	Actual	Difference
Agricultural Credit ¹⁾	8,888	8,795	93
Agricultural Strengthening ²⁾	7,203	2,958	4,234
Total	16,091	11,753	4,327

Note: ¹⁾ Includes procurement of vehicles by implementing organization. ²⁾ Includes consulting services for Agricultural Credit, reserve fund, and commission.

Actual costs of the Agricultural Credit Project are nearly as planned. The yen-based actual project costs of the Agricultural Sector Strengthening Project are at 41% of the original plan, and a 276% increase over the original plan is seen if actual results are calculated in the local currency (guaraní). This is due to the cumulative inflation rate from 1987 to 1995 of approximately 400% and a substantial appreciation of the value of the yen. When calculating expenditures in real terms taking into consideration the inflation rate, actual expenditures were only about 80% of estimated. In addition to that the number of grain storage silo was reduced from six to one, the bidding price itself for the silo construction (23.3 billion guaraní) was substantially less than the expected cost (43.9 billion guaraní), and can be cited as one of the reasons for coming in under cost.

2.2.4 Implementation system

There was no change in institutional arrangement for the implementation from the original plan. Banco Nacional de Fomento (BNF) implemented the Agricultural Credit Project and the Ministry of Agriculture and Livestock the Agricultural Sector Strengthening Project (the name of the division in charge changed but the actual implementation remained the same).

2.3 Effectiveness

2.3.1 Agricultural credit (two-step loan) project

Through the Agricultural Credit Project implemented by the BNF 12,399 loans (including 42 loans to agricultural cooperatives) or a total of 133.3 billion guaraní in two-step loans were provided. The following is a summary of effectiveness of the Agricultural Credit Project:

Changes in farmers' income and living conditions

A survey of the recipients of BNF assistance was conducted as part of this evaluation¹ and of the 106 valid responses, 62 respondents (58%) cultivate soybeans and wheat, 52 respondents (23%) cultivate raw cotton, and 21 respondents (20%) cultivate sugarcane (multiple responses possible).

However, a variety of factors made it difficult to quantitatively measure the affects of this project on farmer income using the results of this survey. Those include the fact that farmers do not keep accurate records, the reliability of individual data is questionable because of a wide variance in figures, and climate and market influences also affected results. However, in response to a question regarding changes in affluence prior to and after receiving loans, out of 106 valid responses, 101 respondents (95%) answered, "quality of life has improved." Furthermore, in cases where financing under this project was not available, 53 respondents (50%) said that they would have made only small investments, 24 respondents (23%) said that they would have made no invest at all. It, thus, may be indicating that the loan program under this project was important to a large number of farmers.

2.3.2 Agricultural Sector Strengthening Project

Extension of agricultural technology and enhanced guidance

Prior to the construction of these facilities, instructors used to visit farmers individually to give guidance. However, due to the low level of the instructors' capacity, and the lack of facilities and equipment for group practice and training, the system was resulted in inefficient, and extension activities were criticized for not being fully effective.

The San Lorenzo facility was constructed to help solve such problems. It is currently referred to as the Skills Improvement Center (Centro de Capacitacion), and there the Ministry of Agriculture and Livestock offers a variety of free courses and seminars to instructors. Additionally, instructors utilize the ten regional small-scale training facilities and meeting rooms constructed under this project, making it possible to hold effective group extension activities for farmers. According to the center's records, the numbers of seminars, events, and courses ranging in length from one day to one week that have been held at the Skills Improvement Center are 47 in 1999, 77 in 2000, and 95 in 2001. As of July 2001, a cumulative total of 554 persons have used the facility.

According to those involved, the facility is utilized to nearly 100% full capacity during the week. Additionally, when usage conditions permit, the facility is open not only to the Ministry of Agriculture and Livestock but also to other ministries and is therefore receiving maximum effective usage.

Development of an agricultural meteorological monitoring network

Prior to the project, there were only six meteorological monitoring stations nationwide. The monitoring system was insufficient, and as a result, the forecast of cold weather damage, heavy rain, and droughts was impossible making it difficult to prevent damage to crop harvest from those

¹ Conducted August 2001. Questionnaire was done on visits with random sampling.

meteorological phenomenon. Thirteen monitoring stations were set up nationwide through the project, starting with the first weather center in the City of Caacupe, making possible the effective collection and analysis of weather data and its timely distribution to those in the agricultural sector. As a result, damage due to unusual weather was prevented before it happened or was kept to a minimum. At present, the facility is considered to be Paraguay's "Weather Databank."

Additionally, results of daily weather data collection and analysis² are summarized monthly and yearly and offered at no charge to local governments, researchers, producers, and agricultural cooperatives. Based on this information, the timing of harvests and shipping can be forecasted, contributing to improvement in production and income dependability. Additionally, not only farmers but also a variety of agencies such as the Itaipu Hydroelectric Power Plant are utilizing the data from the weather center. The Government also uses the data as a basis for planning environmental policy.

Based on the data collected by the center, a variety of research is being conducted on improving agricultural productivity and cultivation technology. Specifically, the center publishes a variety of materials on such topics as: (1) biophenology of raw cotton and wheat, (2) mechanisms of weather phenomenon such as cold weather phenomenon and dry weather that have a reverse effect on agriculture, and (3) research of ideal weather conditions for growing fruit and vegetables.

Extermination of Mexican billbug (Picudo)

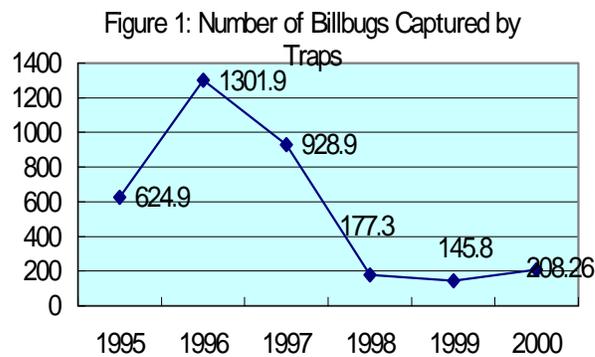
At the time of appraisal damage to raw cotton cultivation was increasing as the Mexican billbug that had emerged as a problem in Brazil subsequently infested Paraguay. However, at that time extermination methods for the billbug were not yet established, and a research center for conducting everything from basic research to practical applied research was necessary.

The constructed facility's activities can be divided into two parts: research activities and extension activities. On the research front, the facility conducted ecological research on the billbug as well as on improved types of raw cotton and its cultivation period, and this became a core part of many domestic and international projects. Additionally, cooperative research programs are being conducted with neighboring countries such as Argentina and Brazil³. Moreover, since moving from the research results phase to actual implementation requires understanding and cooperation from raw cotton farmers, the research center focuses on extension activities, campaigns, and training. In 2000, seeds of improved raw cotton and pest traps were distributed at no charge.

At present, the number of billbugs captured is being monitored with 1100 pest traps at nine locations throughout the country, and the effects of the program are being measured. According to this data, aside from some regional differences, billbug damage nationwide has dramatically decreased since its peak in 1996. Additionally, the research center now conducts research on pests other than the Mexican billbug, and a wide variety of crops aside from raw cotton, for instance bananas, vegetables, and mushrooms, are showing a decrease in pest damage. This indicates a contribution to the overall agricultural sector in Paraguay.

² Data collected by the observation stations include: temperatures (average, high, low), humidity, soil temperature, soil humidity, rainfall amounts, wind speeds, and precipitation amounts, etc.

³ An example of this research is the 1999 "Integrated Picudo Management in Argentina, Brazil and Paraguay."



Source: Pest Research Center

Construction of grain storage silos

The project constructed a silo with the capacity to store 38,400 tons of grain in the wheat-producing region of Puerto Triunfo, Itaipu. Along with the government's policy of reducing its involvement in crop distribution, the silo was leased for a five-year term starting in March 1997 to Cargill Paraguay, to a private company trading in crops that has its headquarters in Minneapolis, MN. Annual lease fees are 520 million guaraní. At the time of appraisal, the Economic Internal Return Rate (EIRR) of the grain storage silos was estimated to be 9.2%, but at the time of evaluation, usage conditions and other factors made the collection of precise data difficult and further evaluation has not yet been conducted⁴.

Harvest prediction system

At the time of project appraisal, there was a need for a system that would allow the accurate estimation of agricultural production volumes in order to formulate the creation of a food import plan and a grain storage plan. The Distribution Division of the Ministry of Agriculture and Livestock established a prediction system and a survey framework, through which the export of agriculture goods was promoted, excess import of food was prevented, and grain storage facilities were expanded. However, with the economic liberalization movement the Government has taken a policy to minimize its intervention in production, distribution, and storage. Therefore, the Government is now focusing on systematizing distribution volumes of products and pricing of individual products rather than the prediction of production volumes.

Services provided by the Agriculture Harvest Prediction Control Center expanded under this project are to support choices of producers, intervening agencies, and consumer through increased the market transparency. Currently, on a daily basis, researchers are assigned to three wholesale markets in Asunción, Este, and Encarnacion, where they investigate the prices of 69 items including fruits and vegetables, and report them to the Distribution Division. The Distribution Division organizes the data into daily reports and distributes it through television and radio stations in 27 regions. Readership mainly comprises local governments, agricultural cooperatives, and researchers. Through this service producers can harvest and ship their products with an eye on market trends, and consumers can be assured that they are paying a reasonable price for food.

Animal Sanitation Control System

In spite of the importance of the livestock industry in Paraguay, at the time of the project's appraisal, the system for controlling infectious diseases in livestock was insufficient. Currently, at the

⁴ At the time of appraisal, the benefits were to be a reduction in the loss of crops and an increase in price through quality assurance. Since it was a private lease, bidding was conducted with two companies submitting bids. If the bidding price of the crop trading company that was awarded the bid is considered to be economic value brought by the use of the silo, the benefit is approximately \$248,000 annually (converted to 1997 exchange rates). Recovery of the \$15 million construction cost will take 60 years. It is impossible to calculate EIRR by the cash flow based on these figures.

quarantine and research facilities constructed under the project, (1) diagnosis of illnesses and research, (2) control of chemical agents, and (3) certification on livestock products to export to ensure quality , are conducted.

Specifically, when there is a report of a possible infectious disease from a rancher, experts are sent to the area to retrieve a sample and examine it. Examination fees are set so that they are comparatively less expensive than private facilities, making the collection of a large number of samples possible. Through this program, the project has been able to grasp the health conditions of livestock on a nationwide level, and produce vaccines based on demand, helping to prevent the spread of infectious diseases.

2.4 Impact

2.4.1 Improvement in production quantity and productivity of agricultural products

The purpose of this project was to achieve structural strengthening of the agricultural sector by the promotion of capital creation of farmers and agricultural cooperatives through the Agricultural Credit Expansion program and through a variety of activities conducted by the Ministry of Agriculture and Livestock that aimed to strengthen the agricultural sector. The project was expected to contribute to the increase in and stabilization of agriculture production.

Increase in agricultural production

Table 3 below shows the change in production volumes of Paraguay's principal products during the five years following the completion of the project. Soybeans, sugarcane, and corn hold the top three positions in terms of export volume, but the crop showing the most significant increase in production is soybeans.

While there are no statistics clearly indicating how and for what crop financing through the project's agricultural credit was used, we can speculate that the project made a certain contribution to the increase in soybean production from the facts that (1) data specifying products targeted by the financing by name show that 85% of the total operation fund went to soybean production and (2) 64% of capital expense funds went to agricultural equipment, and the agriculture products targeted for mechanization were mainly soybeans and wheat.

The drop in soybean production in 2000 was due to damage from unusually dry and cold weather during 1999 and 2000.

Table 3: Change in Production Volume of Principal Crops (Unit: tons)

	1996	1997	1998	1999	2000
Bananas	66,752	68,898	71,454	69,988	70,000
Coffee	4,024	4,823	4,750	4,726	4,800
Corn	654,074	1,055,661	873,904	817,233	900,000
Potatoes	1,838	1,860	1,870	1,391	1,500
Rice	132,460	141,580	80,921	92,000	93,000
Soybeans	2,394,794	2,670,003	2,855,742	3,303,500	2,750,000
Sugarcane	2,736,000	2,795,000	2,800,000	2,872,270	2,850,000
Wheat	400,189	229,173	180,088	231,118	250,000

Source: UN Food and Agricultural Organization

Competitiveness and export volume of agricultural products

The project was also expected to contribute to increase the competitiveness of Paraguay's agricultural products. However, increased competitiveness and export volume varies widely among products. In 1996 soybeans became the leading export good, second to cotton. Although the international price of soybeans has been falling, export volumes have been increasing due to an increase in production because of technical innovation in the 1990's. We can therefore surmise that this project has, to a certain degree, contributed to the increased export of agriculture products such as soybeans.

As a result of billbug damage and soil deterioration, along with the stagnation in international prices after 1996, raw cotton cultivation acreage and production volumes decreased substantially, and the shift is now thought to be toward other crops.

Table 4: Change in Export Volume by Crop (Unit: tons, millions of \$US)

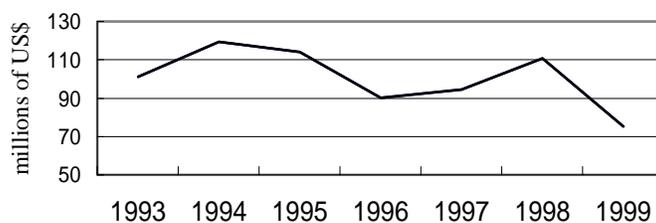
Type	1995		1996		1997		1998		1999	
	Export Volume	Export Value								
Agriculture	1,442,147	460,035	1,783,667	547,396	2,169,073	646,082	2,431,235	563,428	2,297,753	394,936
Raw cotton	127,067	246,356	124,649	186,309	40,871	63,481	55,752	78,398	52,478	61,647
Peanuts	2,186	1,330	1,358	746	26,950	8,330	2,767	1,857	15,708	3,774
Coffee	235	718	74	197	0	2,075	394	905	93	93
Fruit	6,757	1,859	11,846	2,392	n.a.	n.a.	9,365	2,205	n.a.	n.a.
Corn	187,939	21,631	125,256	17,152	180,566	16,340	170,277	19,739	171,033	14,757
Soybeans	1,074,110	175,923	1,456,689	324,156	1,650,695	429,690	2,066,141	434,467	2,048,333	307,135
Tobacco	5,903	6,804	6,173	8,817	6,258	7,150	5,386	8,414	4,624	6,170
Wheat	37,000	4,960	55,700	7,116	263,703	118,968	119,007	16,788	700	78

Source: Paraguay Central Bank

Competitiveness and export volume of livestock products

At the time of evaluation, the technology and knowledge developed by the Livestock Research Institute has not resulted in an increase in exports. From 1991 to 1999, partially due to Mercosur, export values of livestock products have been falling.

Figure 2: Change in Export Value of Livestock Products



Source: IMF Paraguay Recent Economic Development

2.4.2 Environmental impact

According to the Ministry of Agriculture and Livestock, there has been no particular adverse environmental impacts as a result of this project.

2.5 Sustainability

2.5.1 Agricultural credit

BNF executes project agricultural credit according to its regulations. There are two points of criticism, however, with respect to the sustainability and self-development of the project. Those points are related to the re-disbursement of revolving funds and the reorganization of BNF.

Consistent data regarding repayment conditions and the subsequent issue of loans was not obtained. According to an explanation by a representative, (1) fund management is being conducted through a special account set up for the project, (2) arrears on loans to the agriculture sector held by BNF account for about 20% of the total, but since the target of the project's loans is mainly small-scale farmers growing soybeans and wheat, there are a large number of borrowers who are successful at their business, arrears on the project loans are lower than the BNF average ratio of arrears in the agriculture sector, (3) there is a re-disbursement scheme, however as compared with the 20% interest rate of other loans (July 2001) in the market, this project's current loan rate, 24%, is high, so the re-disbursement loan scale is small. Table 5 below shows total cash flow as of the end of 2000, based on data supplied by BNF:

Table 5: Cash Flow under the Project

Inflow		Outflow	
Yen loans	101,780	Disbursed	175,333
Repayment from borrowers	158,886	Yen loan repayment	26,384
Total	260,666	Total	201,717
		Balance	59,494

Since the interest rate of the project's revolving fund loan is higher than that of other projects' rates, there have been almost no re-disbursement realized after 1998 and repayment funds from farmers are accumulating in the revolving fund.

The reorganization of BNF is one of the issues being debated in the restructuring of Paraguay's public financial institutions. There is still a continuing debate on the problem of non-performing loans of public financial institutions including the BNF as well as the future function of public finance. While it is difficult to predict the outcome of this debate the organization and function of the BNF will inevitably change. This will directly affect the management of the project's revolving fund, and it will therefore be necessary to keep a close watch on the situation.⁵

2.5.2 BNF's financial condition

Liquidity

If we look at liquidity on BNF's balance sheet, we can see that while the liquidity ratio has exceeded 1 time in the past four years, it has been on a downward trend since 1998. In a liquidity

⁵ Currently, debate continues on the restructuring of public financial institutions as a whole, but a bill has been submitted that would establish a new development bank combining BNF and other agricultural financial institutions.

constraint in 2000, the central bank and the social security system interjected 250 billion guaraní of public funds in the form of deposits (equivalent to more than half the total deposit balance). This was a measure taken as a result of the major decline in deposits that occurred between 1999 and 2000 (approximately 20% decline in deposit balance), and therefore liquidity is still an area that requires sufficient caution.

Profitability

The BNF operating expenses and revenues recorded a certain level of profit until 1997, however, since 1997 the trend has been one of continuing deficit. The deficit in 1998 was due to a variety of factors including abnormal weather, decline in product price, political turmoil, and high domestic interest rates. This situation brought on a sudden decline in quality of assets, making the transfer of loan loss reserves necessary. At the end of 2000, the total sum of loans that were due was said to be as much as 45% of the total loan amount.⁶ The percentage of non-performing loans has increased dramatically since 1998. Meanwhile, only 40% of the necessary reserve transfer amount had been disbursed as reserves as of 2000, and if 100% had been applied the deficit amount would have been much greater. Most of these non-performing loans were provided to politically close clients and since the effective recovery of such is not easily accomplished, it involves the issue of the reorganization of BNF, and therefore is also a trend that requires close observation.

2.5.3 Strengthening Agricultural Sector Project

The following departments are responsible for operation and maintenance of the listed facilities, with the exception of silos, under the direction of the Ministry of Agriculture and Livestock:

Table 6: Operation and Maintenance Division
Agricultural Sector Strengthening Project

Facility	Department (Spanish names in parentheses)
Skills Improvement Center	Agricultural Extension Division (Dirección de Extensión Agraria)
Mexican Billbug Research Center	Agricultural Survey and Research Division (Dirección de Investigación Agrícola)
Agricultural Harvest Prediction Center	Logistics Division (Dirección de Comercialización)
Agricultural Meteorological Observation Center	Agricultural Survey and Research Division (Dirección de Investigación Agrícola)
Livestock Research Institute	Livestock Administration Division (Subsecretaría de Estado de Ganadería)

The Ministry of Agriculture and Livestock distributes the budgets for those facilities. The annual budget includes the cost of periodic maintenance of equipment and repair, but when unforeseen spending is necessary, the responsible department must apply for further funding from the Ministry of Agriculture and Livestock. For that reason, repairs can be occasionally delayed and funds are at times insufficient. At this evaluation, however, since the Ministry of Agriculture and Livestock did not cooperate in providing necessary information on those organizations, it was impossible to determine the

⁶ International Monetary Fund (2001). Paraguay: Recent Economic Developments. Country Report No. 01/88.

sustainability of the personnel and budget of these research centers and facilities.

3. Lessons Learned

In order to promote revolving fund, and interest rate on secondary disbursement of revolving fund should be offered at market interest rates basis. It is also necessary to look into a way of adopting a fixed interest rate system to be in place at the time of lending.

4. Recommendations

- (1) As mentioned above, to use the revolving fund at BNF effectively we must look into methods and procedures for setting interest rate of secondary disbursement.

- (2) The reorganization of BNF is on-going discussion as one of the highest priority policies of the Paraguayan government including the future of BNF and the reorganization of public financial institutions is under debate. The financial condition of BNF is observed sound judging from the accumulation of non-performing assets, the declining balance of deposits, the declining of retained earnings, and accumulated losses. International organizations such as IMF and the World Bank are now recommending that the current non-performing assets held by BNF be entrusted to a special trust institution, and that the BNF merge with existing agriculture-related financial institutions to establish a new development bank specializing in agriculture finance. This situation will have a direct impact on the management of the project's revolving fund, and therefore requires careful attention.

Comparison of Original Plan and Actual Scope

Item	Plan	Actual
1. Project Scope		
(1) Agricultural credit	Agriculture loans to farmers through the National Development Bank (BNF) 1) Recipients: agricultural cooperatives, agricultural cooperative members, individual farmers 2) Target of Finance: farmland development, construction of agriculture related facilities, purchase of farm equipment, tools, and materials 3) Loan terms: interest 18%, duration 12 years (grace period 5 years)	Same (initial interest was 28%, later changed to 24%))
(2) Agricultural expansion	Construction of a training center, purchase of mobile training units (15), and procurement of equipment and vehicles (6)	Same, vehicles (26) Construction of 10 regional research facilities
(3) Agricultural meteorological observation network	Construction of 15 weather observation center, vehicles (2)	Construction of 13 weather observation centers, vehicles (2), motorcycles (5)
(4) Pest control system	Construction of pest research facility, traps, vehicles (21)	Same
(5) Grain Storage	Construction of 6 silos, vehicles (17), office equipment	Silo construction (1), vehicles (2) Office equipment
(6) Harvest prediction	Computers and other data analysis equipment, vehicles (12)	Construction of an agriculture harvest prediction control center, vehicles (2)
(7) Livestock health	Construction of a laboratory, tick extermination tubs, vehicles (21)	Construction of a laboratory, vehicles (15), motorcycles (2)
(8) Office management	Vehicles (4), office equipment	Same
(9) Consulting services	12M/M	14M/M
2. Implementation Schedule		
(1) Agricultural credit	May 1987 through Dec 1991	Mar 1991 through June 1996
(2) Agricultural strengthening (2-7 above)	Jan 1988 through Dec 1989	Sept 1991 through June 1996
3. Project Cost		
Foreign Currency	11,200 million yen	10,000 million yen
Local Currency	4,900 million yen (6,600 million Gs.)	1,700 million yen (24,700 million Gs.)
Total	16,100 million yen	11,800 million yen
ODA Loan Portion	11,800 million yen	10,100 million yen
Exchange rate	1 guaraní = 0.75 yen (Accumulating since: July 1986)	1 guaraní = 0.0692 yen (Accumulating from: 1991-1996 average)