

PROGRAM TO SUPPORT SMALL-SCALE COTTON PRODUCERS

(PR-0082)

EXECUTIVE SUMMARY

**BORROWER:** Republic of Paraguay (GoP)

**EXECUTING AGENCY:** Ministry of Agriculture (MAG)

<b>AMOUNT AND SOURCE:</b>	<u>Phase 1</u>	<u>Phase 2</u>	<u>Total</u>
IDB:	US\$25.65	US\$16.38	US\$42.03 (90%) (contingent IFF)
Local contribution:	US\$ 2.85	US\$ 1.82	US\$ 4.67 (10%)
Total:	US\$28.50	US\$18.20	US\$46.70 (100%)

**FINANCIAL TERMS AND CONDITIONS FOR PHASE 1:**

Amortization period:	20 years
Disbursement period, phase 1:	5 years
Disbursement period, phase 2:	4 years
Interest rate:	variable
Inspection and supervision:	1%

Credit fee: 0.75% per year on the undisbursed balance

Currency: Dollars of the United States of America from the Single Currency Facility

**OBJECTIVES:** The program's primary objective is to promote sustainability in the production systems of small-scale cotton units, increasing their net income by: (i) reducing production costs caused by cotton pests, through integrated pest management (IPM); (ii) increasing the productivity of small-scale cotton farms through seed improvement, IPM, soil conservation and management practices (SCMP) and crop rotation; and (iii) improving the environment by reducing the unnecessary use of pesticides.

**DESCRIPTION:** In order to achieve the targeted objectives, the program will be executed in two phases: (i) phase 1 will have an execution period of five years and a total cost of US\$28.5 million. In addition to direct technical assistance for 20,000 producers, it will include other complementary activities relating to the pest monitoring and control system, communication campaigns, and improved cotton seed quality, and US\$2 million for the Regional Agricultural Technology

Fund (FONTAGRO); and (ii) phase 2 will have an execution period of four years and a total cost of US\$18.2 million. It consists of expanding the direct technical assistance to another 20,000 producers and the costs of the sixth year of the program for the activities under the pest monitoring and control system and the communications campaign. Phase 2 will be initiated during year three of phase 1 once the goals of phase 1 have been achieved.

The program is organized into four main components, as follows:

The pest control and monitoring system component calls for basic activities for technical assistance to prevent propagation of the boll weevil (*Anthonomus grandis*), such as establishing the following: (i) a monitoring network in the department of Chaco, including measures to keep the area free of weevils; (ii) a pest trap and monitoring network and a plant inspection system for monitoring the cotton pest complex, which will provide the basic information (such as levels of damage, density, distribution, etc.) needed to increase the efficiency of the IPM techniques; (iii) strengthening the MAG quality control laboratory in order to guarantee the quality of locally marketed plant health products; and (iv) technical validation, including activities to evaluate IPM practices and to make any necessary adjustments according to the micro-ecological conditions in the program areas of activity.

The communications campaign consists of activities to support and strengthen other components of the program by implementing a system for production, conservation and use of educational communications messages to train producers in IPM and SCMP techniques, producer organization, pesticide use and management and environmental conservation techniques. Messages and technology packages will be disseminated through newspapers, videos, news reports and rural radio and television programs with national coverage. Educational materials will include videos, cassettes, posters, cards, brochures and fliers on the subject, with a view to achieving the proposed objectives. The campaign will be carried out in Spanish and Guaraní and will target all cotton producers in the country.

Under the technical assistance component, direct technical assistance in IPM, SCMP and crop rotation techniques will be given to 40,000 producers, with a view to production diversification and environmental conservation (also divided into two phases). It will target the achievement of environmental and financial sustainability for small-scale cotton producers through the hiring of outsourced technical units (OTUs). It will also include organizing small-scale cotton producers in order to facilitate technical assistance and stimulate training in terms of access to technology, direct credit and services in general, particularly marketing.

Seed improvement component will strengthen areas considered vital for modernization of the seed subsector, with a view to improving the quality standards of seeds used by farmers. The proposed activities to establish a national seed system will be based on an integrated set of activities carried out by the respective government agencies (plant quality and health) and private sector institutions (production and marketing). By the end of the fourth year of program execution certification of 100% of the seeds sold in the country is expected to be achieved.

**ENVIRONMENTAL AND  
SOCIAL REVIEW:**

The environmental impact studies carried out concluded that most of the impact to be generated by the program should be positive for the environment and the socioeconomic status of small-scale cotton producers. The proposed environmental management plan will seek to strengthen the positive environmental and social impact. During program execution, an environmental specialist is to be incorporated into the National Project Administration and Coordination Office (DINCAP) and a water quality monitoring program carried out to evaluate pesticide content in selected water ways. The program also calls for general monitoring of its execution, including environmental aspects, by an independent group hired by the DINCAP (paragraph 3.26).

**BENEFITS:**

Program execution will generate the following benefits: (i) reduced risk of weevil infestation in the department of Chaco; (ii) identification of the types and density of cotton pests in order to apply efficient methods of combating them; (iii) improved quality of the plant health products sold in the country; (iv) development and validation of new IPM technologies; (v) dissemination of information throughout the country on IPM and SCMP techniques among cotton producers; (vi) improved quality of the seeds sold in the country; and (vii) increased

awareness among the rural population of environmental conservation.

**RISKS:**

The primary risks of the operation are the following: (i) the excessive amount of time that the MAG has required in the past to directly hire OTUs and the various consulting firms could delay program execution. The signing of the agreement between the MAG and the Inter-American Institute for Cooperation in Agriculture (IICA) for the latter to engage the specialized services and technical assistance as provided for in the program could reduce this risk; and (ii) the change in the central government administration of Paraguay scheduled for August 1998, could imply a risk of delays in program execution. However, the program's economic and social importance to the agricultural sector and to the very economy of the country is a factor of considerable political weight that helps minimize the risk.

**THE BANK'S  
COUNTRY AND  
SECTOR STRATEGY:**

The Bank's actions focus on five strategic areas: (i) the financial sector, to contribute to improving operation of the system and support capital market development; (ii) State reform, to improve the State's efficiency in providing public services and to strengthen governance; (iii) modernization of the productive apparatus, to promote economic efficiency; (iv) support for the social sectors, to promote their development; and (v) support for rural areas, to reduce poverty and improve the standard of living of the population, particularly the poor.

Given the importance of the agricultural sector in production, exports and job creation, the proposed operation seeks to address the following strategic guidelines of the Bank: (i) increased income for small-scale farmers and a consequent reduction in rural poverty; (ii) development of commercial agriculture, including mechanization and diversification of small-scale farm production; and (iii) resolution of the environmental problems of deforestation and erosion.

**SPECIAL  
CONTRACTUAL  
CONDITIONS:**

(a) Prior to the first disbursement, the executing agency must demonstrate that: (i) the Operating Regulations agreed upon with the Bank have entered into force (paragraph 3.30); (ii) an agreement has been entered into with the IICA establishing the conditions for the latter to hire the consulting services and technical assistance provided for under the program (paragraph 3.10); (iii) the program's technical operating committee (CTOP) has been created by ministerial decree (paragraph 3.7); and (iv) the DINCAP has the authority to incur the operating

expenses provided for in the annual work plan (paragraph 3.6).

(b) Within six months after program initiation, the executing agency will submit evidence that the School of Agricultural Sciences of Asunción National University has been hired (paragraph 3.27).

(c) The agreement will also contain sufficient provisions to ensure: (i) the collection and processing of data for the ex post evaluation (paragraph 3.43); (ii) a mid-term review of the operation to verify the progress achieved in phase 1 (paragraph 3.32); and (iii) an ex post evaluation (paragraph 3.42).

**POVERTY TARGETING  
AND SOCIAL  
ASPECTS:**

According to the criteria set forth in the Eighth Replenishment document, the proposed program qualifies as targeting social equity and poverty reduction (AB-1704, paragraphs 2.13 and 2.15), since it will serve rural areas with a higher proportion of low-income groups, and the majority of its beneficiaries will consist of low-income groups (paragraph 4.21).

**EXCEPTIONS TO  
BANK POLICY:**

See the section on procurement below.

**PROCUREMENT OF  
GOODS AND  
CONSULTING  
SERVICES:**

The Bank's current policy will be followed for the procurement of goods and the awarding of contracts for works and consulting services to be financed with program resources. When the proceeds of the IDB loan are used, the thresholds above which international competitive bidding will be required will be the following: US\$250,000 for the procurement of goods and US\$200,000 for consulting services. It is recommended that, as an exception to the open competition selection procedure, the IICA (paragraph 3.10) and the Asunción National University School of Agricultural Sciences (paragraph 3.27) be hired directly. The two institutions will carry out any type of procurement or other activities required in accordance with Bank procedures. Such contracts will satisfy the stipulations set forth in section GS-403 of the Procurement Manual.

**PROCEDURES FOR  
APPROVAL OF  
PHASE 2:**

The Bank will consider phase 2 once the following conditions have been fulfilled: (i) at least 50% of the resources for phase 1 of the program have been disbursed; and (ii) satisfactory progress has been made in achievement of the established goals (paragraphs 3.32 and 3.41).

## I. FRAMEWORK OF REFERENCE

### A. The agricultural sector

- 1.1 The agricultural sector is the main axis of the Paraguayan economy and therefore plays a vital role in the welfare of the majority of the population. The sector produces almost all the food consumed domestically; it employs some 35% of the economically active population; it contributes 27% of gross domestic product (GDP); and in primary and processed products, generates some 90% of recorded exports.
- 1.2 Until the late 1980s, the moderate growth in the agricultural sector was based on the expanding agricultural frontier, with accelerated deforestation and the colonization of public lands, supported by increased State intervention. In some cases, expansion included the introduction of new crops and the appearance among the sector's traditional exports of products with higher value added, such as cotton and soybean, which are now the country's main exports. Their share of total exports has ranged from 62.3% in 1990 to 40% in 1997.
- 1.3 In the 1990s, the performance of the agricultural sector in terms of production and productivity has been poor, which appears to indicate that the agricultural frontier expansion model has reached its limits, showing clear signs that major changes are urgently needed. Growth in the agricultural GDP between 1990 and 1996 was 2.3% per year, below the 3.1% annual natural increase in the population. The sector's share of national exports dropped from 97% in 1990 to 88% in 1996. The sector's loss of momentum, particularly in the crop-farming subsector, during a time of change and adjustment in world agricultural markets and the country's entry into MERCOSUR, demonstrates the urgent need for Paraguay to update its sector mechanisms, guidelines and policies in order to reactivate growth in the agricultural sector and ensure its sustainability.
- 1.4 In this context, the Ministry of Agriculture (MAG) of the Government of Paraguay (GOP) has prepared a new operating strategy for the sector, which to a large extent would be implemented through the Modernization Program for Farming and Forestry Development (PROMODAF), which is currently being analyzed for Bank financing. The strategy incorporates three new concepts for agricultural development: (i) intensified land use with sustainable production systems; (ii) diversification of productive activities; and (iii) increased productivity.
- 1.5 The PROMODAF is promoting a comprehensive, broad-based reorganization of the sector's technical and administrative apparatus with a view to creating conditions for the systematic participation of civil society, the adoption of more efficient

macro- and sector-level policies, and the specialization and activation of producer support services, such as market information, applied agricultural research, technical assistance for small-scale farmers, and animal and plant quality and health monitoring services.

- 1.6 To support these reforms, the Executive sent a bill to the National Parliament in March 1997, which only recently began to be studied in committee in February 1998. Given the political negotiations under way to advance the structural and legal reforms, the Bank and the GOP have agreed to move ahead with the preparation of two projects that were included under PROMODAF and could be implemented even without structural changes. Priority was assigned to the one for support for small-scale cotton producers 1/, because of the social and economic importance of maintaining the employment and income levels of rural small-scale farmers, particularly cotton growers, and preventing a greater decline in their standards of living, which would result in increased emigration to cities and greater rural poverty.

#### 1. Small-scale farming

- 1.7 Family-run or small-scale farming is an important segment of agricultural production, generating some 33% of the gross value of sector production and supplying most of the basic commodities for domestic consumption (76% of cassava, 75% of beans and 58% of corn), and some 78% of cotton. This segment makes such a contribution despite low levels of productivity resulting from a lack of technological development and effective systems to provide services that support production.
- 1.8 Paraguayan small-scale farmers are characterized by the following: (i) they operate production units of less than 20 hectares; (ii) they have low levels of technology; (iii) they use primarily family labor; and (iv) they produce most of the food they consume. In 1991 there were 247,600 small-scale farms with a population of some 1.3 million, representing 67% of the rural population and 33% of the country's total population. These indicators illustrate the size of this segment in Paraguayan society.
- 1.9 The stagnating productivity observed in the primary small-scale farm production crops (cotton, beans, cassava and peanut) over the past decade has contributed to widening the significant gap between the standards of living of the country's urban and rural population. According to a study carried out in 1992 2/, 73% of all families in the country's lowest income distribution deciles were rural. A more recent study, carried out on the basis of

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1/ The second project is the program to support mechanization and diversification of agricultural production (PR-0084).

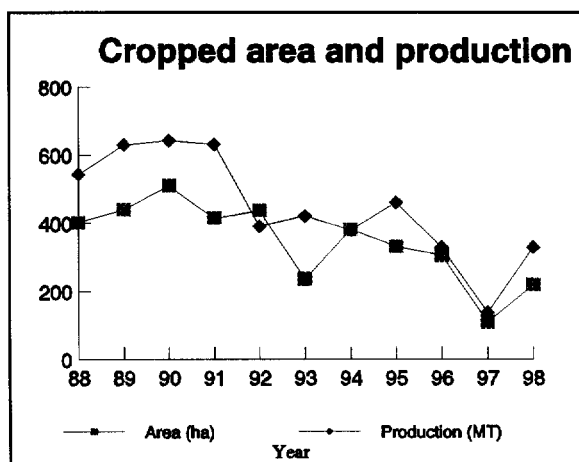
2/ SAUMA, "Income distribution in Paraguay," 1993.

surveys of small-scale producers (with farms between 1 and 12 hectares in area) in colonization areas <sup>3/</sup> indicated that rural poverty rates increased from 38% to 54% between 1991 and 1995. This contrasts with the lower poverty levels noted in regions with a more diversified economy, such as the central region, or in border areas with more profitable crops, such as soybean and corn.

## 2. The cotton subsector

1.10 Cotton production is directly linked to the development of Paraguayan agriculture. In addition to being the country's most or second-most important generator of foreign exchange continually since the 1970s, its economic and social impact has been maintained over time as one of the largest generators of income and employment in rural areas, particularly for the small-scale farming sector. Cotton production is the primary source of cash income and jobs for some 180,000 small family-run farms. These producers grow an average of 2.2 hectares of cotton and altogether contribute some 80% of national production. The few cotton producers with farms over 20 hectares in area are producing improved seeds.

1.11 During the three decades from 1960 to 1990, the cultivated land area and yields of cotton increased significantly, achieving annual growth rates of 10.8% and 2.3%, respectively. However, in the 1990s, yields have stagnated and average annual declines of 15.5% in cultivated land area have been noted. The 64% drop in cultivated area during the 1996/97 growing season reflects the seriousness of the situation. The drop in terms of both production and cultivated land area was due to various factors, most notably the low prices obtained for Paraguayan products because of their low quality, changes in the sector financing system, government intervention in the mass purchase and distribution of seeds, which restricted competition for quality, soil depletion in the production areas, the agricultural frontier expansion model and, above all, the appearance of the weevil (*Anthonomus grandis* B.), which reduced yields and increased production costs because of the greater use of pesticides.



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<sup>3/</sup> FIDA/CPES and PRONOR-FIDA/CPES



### 3. Sector policies

- 1.12 The cotton subsector has traditionally been assigned priority in the government's agricultural policy, due to the low incomes of small-scale producers. Until 1995, financial support for cotton production, channeled through the cotton ginning industry, was traditionally financed by means of discounting operations carried out by the Central Bank of Paraguay. The Paraguayan government has also intervened directly in the marketing and distribution of seeds (in some seasons at no cost to producers), and through special lines of credit from Banco Nacional de Fomento (BNF), Crédito Agrícola de Habilitación (CAH) and the Small-scale Farm Development Fund (FDC).
- 1.13 By eliminating its discounting activities in 1994 and approving the Seed Act in 1995, the government attempted to reduce its intervention in the subsector, thereby allowing greater development of private sector activities. However, political sensitivity of the subsector, along with difficulties in the national financial sector, have prevented any greater reduction in government participation in the financing and provision of inputs for cotton farming.
- 1.14 Product marketing and processing are basically carried out by a total of 33 cotton ginners distributed across 12 departments. Direct marketing by groups of producers organized in cooperatives covers only 2% of national cotton production. The dispersion of crops in small production units makes it extremely difficult to supervise and administer collection activities. Cotton ginners have therefore traditionally depended on an extensive network of intermediaries that collect, transport and sell small quantities of cotton grown on small farms. In this system, the intermediaries keep a significant proportion of the value of the product, thereby reducing the gains to farmers.
- 1.15 Since 1995 the government has been attempting to make significant changes to the system of cotton input supplying and marketing in an effort to replace the intermediaries through measures taken by public-sector institutions. However, it has not been successful in completely replacing the intermediaries network, nor has it substantially improved the services provided to producers.

### 4. Problems in the small-scale cotton farming subsector

- 1.16 This subsector is characterized by low levels of technology, as small-scale farmers primarily use rudimentary agricultural implements and practices. Low productivity and low net income for the farmers are therefore a feature of the subsector. The primary factors affecting the subsector are described in the following paragraphs.

a. The boll weevil (*Anthonomus grandis* B.)

- 1.17 In 1992 the boll weevil was added to locally known pests (nematodes, bollworms, etc.) and it is now one of the biggest problems faced by producers and one of the causes of the decline in sector production. Weevil infestation now affects the entire eastern region, which is the country's primary cotton producing area. To control the pest, the number of pesticide applications has been increased from an average of less than 4 to 6 applications, leading to environmental pollution, public health risks and increased production costs. During the most recent crop season, these applications represented the largest category of monetary production costs.
- 1.18 Approximately 90% of producers are unfamiliar with integrated pest management practices (concentrated harvesting, edge spraying, periodic monitoring and collection of fallen bolls) for controlling infestation. The precarious technical assistance and rudimentary equipment used on the farms makes it difficult to control pests. Moreover, health monitoring in the country is not part of a comprehensive system that includes both ongoing activities to maintain plant health (such as a quality control laboratory) and temporary measures to improve the plant health in agricultural production.

b. Poor seed quality

- 1.19 The current shortcomings in the quality of cotton seed and the lack of seed resistant to weevils and other pests are compounded by the government interventions that cause distortions in the sector. In the past, the government intervened in the production and distribution system, controlling some 80% of the market by using cotton pips for seed. Under this arrangement, the production from cotton fields belonging to farmers who did not have effective quality control for appropriate seed production was sent to the Cotton and Tobacco Inspection Office (OFAT), as a commission, where it was treated and converted into seed, to then be sent to the gins for distribution to small-scale producers.
- 1.20 Recently, in 1994, through Law No. 385/94, the government delegated seed production to the private sector. However, the lack of a competitive market and low levels of mechanized cotton seed production have prevented proper development in terms of quantity and quality. The government has therefore frequently had to import seed from the United States and Argentina for distribution to producers. There are still shortcomings in seed quality inspection and certification by the MAG Seed Office (DISE), because of a lack of funds. Pursuant to a February 1998 decree, the government regulated changes for seed certification services that will be channeled to the DISE through the National Seed Fund, as provided for under Law 385/94.

c. Deficient soil management and conservation practices

- 1.21 Although there are soils in this country of good physical quality, capable of supporting agricultural production, a high percentage of the soils are sandy, with high levels of acidity and low nutrient retention. Furthermore, in the country's central region inappropriate soil use has led to its degradation and a gradual loss of fertility, reducing productivity. The following factors have contributed to these problems: (i) continuous and inappropriate plowing; (ii) single crop practices with long planting periods and no conservation measures; (iii) little use of green manure; and (iv) shortening or absence of the fallow periods for the land within specific crop rotations.

d. Shortcomings in technical assistance services

- 1.22 The public rural extension service provided by the MAG has serious structural limitations, in terms of both methodology as well as quality and coverage. The strategic planning of its programs is weak and its available resources limited, which prevents it from attaining its objectives and goals. Only 8% of small-scale cotton producers receive free technical assistance from the MAG, which is characterized by isolated, scattered activities, with no major impact on productivity in the subsector, or on effective control of the boll weevil problem and other cotton pests. The absence of a comprehensive approach, leads to neglect of more efficient crop rotation techniques and opportunities to diversify production at the cotton farm level.

5. The cotton market

- 1.23 According to the International Cotton Advisory Committee (ICAC), in the short and medium terms there is a relative equilibrium between the production and consumption of cotton fiber, primarily because of the difficulties faced by producers in increasing their yields. This would indicate that prices should not vary widely during the program execution period. The ICAC estimates that the consumption of cotton fiber, which has remained steady for several years at 18.5 million metric tons (MT), will grow at an annual rate of some 1.8% over the next 10 years, reaching 20 million MT in the year 2000 and 22 million MT in 2005.
- 1.24 Because of its geographic proximity and lower transportation costs, the Brazilian market has been one of the main importers of Paraguayan cotton production, importing between 0.3 million and 0.5 million MT of fiber per year this decade. In early 1998, Paraguayan cotton had been absent from the Liverpool market because of quality problems, but it is now again being quoted on this important market. This implies the existence of markets for Paraguayan cotton, provided that it meets internationally acceptable quality standards.

B. Country strategy for resolving the problems identified

- 1.25 In 1997 the government launched a national cotton growing reactivation plan, which includes activities designed to address the problem of the boll weevil and other cotton pests; improve the availability of seed and other inputs; support better soil management practices; and strengthen research and technical assistance services for the subsector. It also includes the financing and distribution of inputs to the producers directly through the state-run financing institutions. The goal is to complete the plan with a cropped area of 420,000 hectares and productivity of 2,000 kilograms per hectare. According to government estimates, the area planted with cotton was 220,000 hectares, with expected production of 330,000 MT this season (in the 1996/97 season 110,000 hectares were planted and productivity was on the order of 1,300 kilograms per hectare).

C. Program design

- 1.26 Based on the experience of other affected countries, the particular Paraguayan characteristic of cotton being produced in thousands of small family-type units means that a pest eradication strategy will be costly and unlikely to succeed. Given this situation, the program proposes a broad, comprehensive plan of technical actions consistent with the strategy adopted by the MAG to control the weevil.
- 1.27 The strategy means that the country must make a broad, consistent effort that integrates pest control and increased cotton productivity as a component to improving small-scale agricultural production systems, including IPM, SCMP and crop rotation practices in the context of production diversification, as called for by the program. The program will also supplement and strengthen the measures to be taken under the government's five-year plan for pest control, prevention and monitoring, seed improvement and direct technical assistance, and mass communication to all producers in the country. Adopting the practices called for in the program will promote the production of better quality fiber that will consequently command better prices, resulting in higher income for producers.
- 1.28 The program design also assumes the implementation of a new strategy to provide technical assistance to small-scale producers by hiring private firms, and strengthening the capacity of the public sector to inspect and supervise these companies. The number of producers directly affected needed to maximize the demonstrative effect of the proposed actions and thus have a significant impact in the cotton sector has been estimated at 40,000.

D. The Bank's country and sector strategy

- 1.29 The Bank's actions focus on five strategic areas: (i) the financial sector, to contribute to improving operation of the system and support capital markets development; (ii) State reform, to improve the State's efficiency in providing public services and to strengthen governance; (iii) modernization of the productive apparatus, to promote economic efficiency; (iv) support for the social sectors, to promote their development; and (v) support for rural areas, to reduce poverty and improve the population's standard of living, particularly the poor.
- 1.30 Given the importance of the agricultural sector in production and exports and job creation, the proposed program seeks to implement the following strategic guidelines of the Bank for the country: (i) increased income for small-scale farmers and a subsequent reduction in rural poverty; (ii) development of commercial agriculture, including mechanization and diversification of small-scale farm production; and (iii) resolution of the environmental problems of deforestation and erosion.

E. Experience of the Bank and other international institutions

1. IDB

- 1.31 Since 1961, the Bank has approved a total of US\$195.9 million in loans for the agricultural and fisheries sector, which represents 21% of the Bank's total approved loans to Paraguay. In the 1960s, financing primarily targeted colonization and agricultural credit for small-scale producers. Beginning in the 1970s, the Bank financed integrated rural development programs (IRD's), with a view to strengthening and expanding key activities in the sector, such as rural extension, agricultural research, marketing, improved seed production, agricultural credit, and agricultural education. It also financed a global agricultural credit program and a plan for controlling foot-and-mouth disease. In the 1980s, the Bank granted three loans for consolidation of rural colonies in the Alto Paraná, integrated rural development in the Department of Paraguari, and for a global agricultural credit program.
- 1.32 In 1992, the Bank approved a project for consolidation of rural colonies (loans 694/OC and 891/SF) in the amount of US\$55.6 million, with a view to introducing sustainable development in a typical area of the small-scale farming sector. The project included, among other actions, building transportation and social infrastructure, production support, improved marketing, promoting the use of credit and strengthening social services. This project is currently under way and, in May 1997 was reformulated in order to correct deficiencies identified during the first three years of execution, which were due to the following: (i) restrictions in the public-sector human resources policy, which prevented the additional personnel needed from being hired and reassigned;

(ii) operational gaps between the various entities involved in project execution, resulting in inefficiencies in the activities of the various components; and (iii) administrative procedures that did not make the funds available in the field on a timely basis.

- 1.33 The reformulation focused on providing technical assistance and training producers by hiring extension services from the private sector. However, because the MAG has not significantly changed its administrative procedures, hiring such services continues to be a slow, complex process.
- 1.34 A nonreimbursable technical-cooperation project is also being executed in Paraguay to promote nontraditional agricultural exports (ATN/SF-5640), in the amount of US\$250,000, approved in 1997. The results of this operation should lay the foundations for preparation of the small-scale farm mechanization and agricultural diversification program (PR-0084) (see paragraph 1.6).
- 1.35 In addition, the first stage of the national rural road program, which was approved in 1993 in the amount of US\$40.9 million (some 60% disbursed), is being satisfactorily executed. Execution of this program will contribute to increasing the value added of agricultural production, through reduced transportation costs, access by the population to social services and agricultural extension, and promotion of activities to protect the environment and indigenous communities.

## 2. Other international institutions

- 1.36 The World Bank has also financed rural development projects, such as: (i) Caazapá rural development, in the amount of US\$31 million, execution of which was recently completed; and (ii) northern axis rural development, in the amount of US\$21.4 million. Both projects were executed by the MAG/DINCAP with the participation of several specialized sector institutions. In June 1994, the World Bank approved a new loan of approximately US\$50 million for a natural resource management program in the Itaipú and Alto Paraná areas, the total cost of which has been estimated at the equivalent of US\$79.1 million.
- 1.37 In 1987, the Overseas Economic Cooperation Fund (OECF) of Japan granted a loan of approximately US\$95 million for an agricultural sector support project (credit, machinery and infrastructure) and the Paraguayan government is currently executing a second stage of the project totaling US\$130 million. The German cooperation agency GTZ has also financed various demonstration projects. Among them are the San Pedro Norte rural development project (US\$2.5 million), a project for natural resource management planning, which is currently in its third phase of execution by the DINCAP and will be completed in 1998, and a project for development and dissemination of sustainable agricultural production systems in Paraguay's eastern region.

F. Lessons learned

- 1.38 In reviewing agricultural projects executed in Paraguay, it can be observed that in most cases the physical objectives, but not all the development objectives, have been achieved. Most of the projects have included specific actions that have not allowed the country to create a vision and a comprehensive capacity to resolve the sector's priority problems.
- 1.39 The above notwithstanding, the rural colonies program, after its reformulation, implemented a new system intended to attain the proposed development objectives. This system consists of engaging outsourced technical units (OTUs) to provide commercial, organizational and technical advisory services to producers. It is experiencing good results and has been well received by the small-scale farmers targeted. These experiences have therefore been collected, expanded and strengthened under the proposed program. The design of the program also seeks to mitigate the problems encountered in the hiring of the technical assistance services to be provided under the program.

## II. THE PROGRAM

### A. Introduction

- 2.1 The proposed program will provide direct technical assistance to 40,000 small-scale cotton producers. The program will have an execution period of six years, divided into two phases, in order to reduce any execution risks:
- a. Phase 1 would be the object of the proposed first loan for US\$25.65 million and have a total cost of US\$28.5 million. In addition to direct technical assistance to 20,000 producers, it will include other supplementary activities for the pest monitoring and control system, communication campaigns and improved cotton seed quality, which are indivisible and will have an impact on the entire cotton sector in the country. Also included are resources for Paraguay's US\$2 million contribution to the Regional Agricultural Technology Fund (FONTAGRO). Phase 1 will have a duration of five years;
  - b. Phase 2 would be the object of a possible subsequent loan of US\$16.38 million and have a total cost of US\$18.2 million. It includes the expansion of direct technical assistance to another 20,000 producers, along with the costs of a sixth year of the program for the pest monitoring and control system and the communications campaign. Phase 2 would be initiated in year three of phase 1 and will have a duration of four years.
- 2.2 Consideration of phase 2 will be triggered once the preestablished requirements have been satisfied and progress achieved in program execution, as specified in chapter III (paragraphs 3.32 and 3.41). If deemed necessary, at that time a memorandum on the progress achieved during the execution of phase 1 and any necessary adjustments will be submitted to the Board of Executive Directors and authorization will be requested to launch phase 2.

### B. Objectives

- 2.3 The program's general objective is to promote sustainable production systems for small-scale cotton producing units, thereby improving their net income.
- 2.4 The program's specific objectives are to: (i) reduce production costs caused by cotton pests through integrated pest management (IPM); (ii) increase productivity through improved seeds, IPM, soil conservation and management practices (SCMP) and crop rotation; and (iii) improve the environment by reducing the unnecessary use of pesticides.



C. Goals

- 2.5 The main goals of the program are the following: (i) provide direct assistance in IPM and soil conservation and management techniques to 40,000 low-income producers; (ii) provide information on such techniques to the country's existing producers (some 180,000) through the mass media; (iii) strengthen and expand the pest monitoring and control systems in the country's cotton producing areas, including the department of Chaco; (iv) improve the quality of cotton seed being used; and (v) strengthen the quality control laboratory.

D. Description of the program

1. Pest monitoring and control system - (phase 1: US\$2.8 million; phase 2: US\$300,000)
- 2.6 Chaco monitoring network. This subcomponent consists of the installation and operation of a boll weevil monitoring network in Chaco (the western region of the country), which is free of this pest. The purpose of the network will be to detect the presence of the weevil and, if necessary, to take the necessary plant health measures to control it.
- 2.7 Pest trap and monitoring network. This subcomponent consists of the installation and operation of a network of weevil traps in the eastern region and a plant inspection system to monitor the cotton pest complex and obtain basic information (such as the degree of damage, density, distribution, etc.) to increase the efficiency of the IPM techniques and adapt them to local agroecological conditions.
- 2.8 Quality control laboratory. This subcomponent consists of strengthening the MAG laboratory to ensure the quality of the plant health products used to combat weevils and other cotton pests.
- 2.9 Validation of IPM technology. This subcomponent consists of evaluating IPM practices in order to make any necessary adjustments, in accordance with the agroecological conditions in the program's areas of activity.
2. Communications campaign - (phase 1: US\$3.1 million; phase 2: US\$500,000)
- 2.10 This component will support and strengthen the activities of the other program components by implementing a system for the production, conservation and use of educational communications materials to train cotton producers. To attain these objectives, the following activities will be carried out: (i) a group of technicians will be trained in the dissemination of information on agricultural production techniques; (ii) technology dissemination packages will be prepared to provide information and training

messages on issues such as producer organization, IPM, SCMP, crop rotation, pesticide management and use and environmental protection; and (iii) the equipment needed to disseminate the materials prepared will be procured. The materials will be disseminated through newspapers, news announcements and rural radio and television programs with national coverage. The educational materials will include videos, cassettes, displays, posters, brochures and flyers on the topics. The campaign will be carried out in both Spanish and Guaraní, and will target all the cotton producers in the country.

3. Technical assistance - (phase 1: US\$14.7 million; phase 2: US\$14.7 million)

2.11 This component consists of providing direct technical assistance in IPM, SCMP and crop rotation techniques in a context of diversification of production and environmental preservation to 40,000 producers located in 50 microregions in the eastern region of the country. The extension work will place emphasis on training farmers in the selection and appropriate use of pesticides, as well as the adoption of safety measures to avoid any toxic impact. The assistance will target small-scale cotton producers with farms of 1 to 20 hectares, which are the ones most affected by weevil infestation. It will be executed by engaging OTUs (paragraph 3.21).

2.12 The technical-assistance component also includes organizing small-scale cotton farmers, to facilitate the technical assistance and promote farmer training, thereby creating opportunities for their access to technology, direct credit, and services in general, particularly those for marketing. Producers will thus be able to take better advantage of production and business opportunities, eliminating excessive financial intermediation and crop collection services. The technical assistance will focus on the economic and environmental sustainability of cotton farm production systems.

4. Seed improvement - (phase 1: US\$900,000)

2.13 This component consists of strengthening areas considered vital for modernization of the seed subsector, with a view to improving the quality standards of the seeds used by the farmers. The proposed actions to create a national seed system will be based on a set of activities executed in integrated fashion by the responsible government agencies (plant quality and health) and private-sector institutions (production and marketing). They will include strengthening the MAG in the use of its legal authority in areas such as: (i) production of basic cotton seeds of the varieties generated, introduced and recommended by the local research institutions; (ii) adoption of systems to produce certified and inspected seed in accordance with current legislation; (iii) incentives to ensure private-sector production and marketing of seed for commercial crops; (iv) promotion and coordination of

training plans for the MAG seed unit, as well as for the private-sector entities involved in seed production, processing and marketing; and (v) increasing the coverage of the quality inspections to 100% of cotton seed fields.

5. FONTAGRO - (phase 1: US\$2 million)

- 2.14 This component includes financing for the contribution that the government is committed to providing to FONTAGRO, which was established as a mechanism for supporting technological development in the agricultural sector by all the Bank's member countries.

6. Studies - (phase 1: US\$300,000)

- 2.15 This category consists of studies to establish a copayment system for the technical assistance beneficiaries and the costs of the ex post evaluation on the rural colonies consolidation program (loans 694/OC and 891/OC) that is at the final execution stage. That program was the first to include agricultural technical assistance through the hiring of OTUs, the system to be used under the proposed program as well.

7. Management and administration - (phase 1: US\$2.9 million; phase 2: US\$1.7 million)

- 2.16 This category consists of hiring the IICA (paragraph 3.10) and the School of Agricultural Sciences (FCA) of Asunción National University (paragraph 3.27) to support the DINCAP in program supervision. It also includes the incremental costs of the DINCAP to administer program execution. It does not include the cost of MAG staff remuneration.

E. Program costs

- 2.17 The total cost of the proposed program is estimated at US\$46.7 million. The following table indicates the cost of phases 1 and 2 of the program, by source of financing.

COSTS PER COMPONENT OF THE TWO PHASES OF THE PROGRAM (in thousands of US\$)								
CATEGORY	PHASE 1			PHASE 2			TOTAL	%
	IDB	LOCAL	TOTAL	IDB	LOCAL	TOTAL		
<b>1. Management and Administration</b>	2,095	775	2,870	1,140	515	1,655	4,525	9.7
1.1 Consulting services	1,680	0	1,680	1,080	0	1,080	2,760	
1.2 Equipment	315	0	315	60	0	60	375	
1.3 Training	100	0	100	0	0	0	100	
1.4 General support and services	0	775	775	0	515	515	1,290	
<b>2. Pest Monitoring and Control</b>	2,017	760	2,777	161	135	296	3,073	6.6
2.1 Consulting services	169	0	169	0	0	0	169	
2.2 Equipment	1,653	55	1,708	161	0	161	1,869	
2.3 Training	195	40	235	0	0	0	235	
2.4 General support and services	0	665	665	0	135	135	800	
<b>3. Communications Campaign</b>	2,165	930	3,095	360	95	455	3,550	7.6
3.1 Consulting services	260	0	260	40	0	40	300	
3.2 Equipment	375	0	375	0	0	0	375	
3.3 Training	880	0	880	0	0	0	880	
3.4 General support and services	650	930	1,580	320	95	415	1,995	
<b>4. Technical Assistance</b>	14,710	0	14,710	13,690	960	14,650	29,360	62.9
4.1 Consulting services	14,400	0	14,400	13,440	960	14,400	28,800	
4.2 Training	310	0	310	250	0	250	560	
<b>5. Seed Improvement</b>	752	112	864	0	0	0	864	1.9
5.1 Consulting services	174	0	174	0	0	0	174	
5.2 Equipment	310	0	310	0	0	0	310	
5.3 Training	196	0	196	0	0	0	196	
5.4 General support and services	72	112	184	0	0	0	184	
<b>6. Studies</b>	240	50	290	0	0	0	290	0.7
6.1 Consulting services	240	50	290	0	0	0	290	
<b>SUBTOTAL</b>	21,979	2,627	24,606	15,351	1,705	17,056	41,662	89.2
<b>7. FONTAGRO</b>	2,000	0	2,000	0	0	0	2,000	4.3
<b>8. External Auditing</b>	250	0	250	100	0	100	350	0.7
<b>9. Finance Charges</b>	256.5	0	256.5	163.8	0	163.8	420.3	0.9
9.1 Inspection and supervision (1%)	256.5	0	256.5	163.8	0	163.8	420.3	
<b>10. Contingencies</b>	1,164.5	223	1,387.5	765.2	115	880.2	2,267.7	4.9
<b>GRAND TOTAL</b>	25,650	2,850	28,500	16,380	1,820	18,200	46,700	100.0
	90.0%	10.0%		90.0%	10.0%			

#### F. Program financing

- 2.18 Pursuant to the financing matrix for the country, and considering that the project targets low-income groups (paragraph 4.21), the Bank will contribute 90% of the total program cost, which is equivalent to US\$42.03 million (US\$25.65 million in phase 1 and US\$16.38 million in phase 2). The ordinary capital resources will be disbursed in dollars of the United States of America (Single Currency Facility), in accordance with Bank policies. If the Bank determines that it has resources available for Paraguay in the Intermediate Financing Facility (IFF) account, phase 1 will be financed from that account. The local contribution, equivalent to US\$4.67 million, or 10% of the total program cost, will be from the MAG budget.

2.19 The proposed loans will be subject to the following conditions:

	Phase 1	Phase 2
Total financing:	US\$25.65 million	US\$16.38 million
Amortization period:	25	25
Grace period:	5	4
Disbursement period:	5	4
Interest rate:	Variable	Variable
Inspection and supervision:	1%	1%
Credit fee:	0.75% on undisbursed balances (phase 1)	
Currency:	Dollars of the United States of America from the Single Currency Facility (phase 1)	

### III. THE EXECUTING AGENCY AND PROGRAM EXECUTION

#### A. The executing agency

- 3.1 The Program will be executed by the Ministry of Agriculture (MAG) through the National Project Coordination and Administration Office (DINCAP), attached to the Ministry. The DINCAP was created in 1986 and restructured in 1995, has experience in the execution of rural development projects financed by the IDB and the World Bank.
- 3.2 The MAG's current organizational structure consists of 3 Undersecretariats of State, 6 general offices, and 11 specialized technical offices. Its primary functions are the following: formulation and implementation of agricultural and forestry directives and policies; promotion and regulation of agricultural production; agricultural technical education; systems for agricultural credit and rural organization and cooperatives; issues involving natural resources and the environment, colonization and agrarian reform.
- 3.3 Execution of the program's specific components will be supervised and coordinated by the following MAG technical offices (DTs): (i) the Plant Protection Office (DDV) will be responsible for the Chaco monitoring network subcomponent and the quality control laboratory; (ii) the Agricultural Research Office (DIA) will be responsible for the subcomponents for the validation of IPM technologies, pest traps and the monitoring network, the latter in coordination with the DDV; (iii) the Agricultural Extension Office (DEAG) will be responsible for the communications campaign and technical assistance component; (iv) the Seed Office (DISE) will be responsible for seed improvement; and (v) the Marketing Office (DC) will provide technical support for product marketing, sale and processing.

#### 1. Organization of the DINCAP

- 3.4 The DINCAP has an organizational structure specifically designed for the execution of rural development projects. Its central office consists of three departments, planning and technical support, operations, and financial administration, as well as five support units: document processing, project monitoring, human resources, auditing and legal support.
- 3.5 The DINCAP also has a decentralized structure consistent with the requirements of the programs that it executes. For the proposed program, Monitoring and Supervision Offices (OSF) will be installed, consisting of an agricultural engineer and an administrative assistant, to monitor and coordinate the field work and determine the degree of progress of the program and compliance with the conditions established in the service contracts with the

OTUs. These professionals will be trained in techniques and methods for monitoring and supervising OTUs and in SCMP and IPM, so that they can carry out their duties more efficiently. Similarly, the DINCAP will have the support of an international consultant for management of the monitoring system, evaluation of results and performance, and management of information generated in the field.

## 2. Responsibilities of the DINCAP

- 3.6 The DINCAP will have the following program execution responsibilities: (i) perform financial management and maintain accounting records and disbursement records and render accounts to the Bank, according to the previously approved chart of accounts; (ii) review all bidding documents and invitations to bid for the procurement of goods and the awarding of contracts for services; (iii) coordinate the subexecuting agencies throughout the entire bidding process and obtain the Bank's nonobjection; (iv) carry out the physical and financial scheduling for execution of the various components; (v) monitor the application of all the rules and procedures set forth in the loan contract; (vi) taking the necessary steps or measures to fulfill the contractual loan conditions; and (vii) act as the sole channel of communication between the country and the Bank in administrative, technical and financial matters. In order to expedite program execution, the DINCAP must have the authority to incur the operating expenses provided for in the program work plan, to be approved annually by the MAG and the Bank. A ministerial resolution granting this authority to the DINCAP will be a condition precedent for the first disbursement.

## 3. Responsibilities of the Technical Operating Committee (CTOP)

- 3.7 This committee, consisting of the DTs participating in the program and a representative of the MAG Legal Office, and chaired by the DINCAP director, will be created by ministerial resolution, in accordance with parameters to be agreed upon with the Bank, which will be a condition precedent to the first disbursement. The committee will have the following responsibilities in program execution: (i) review and approve the annual work and investment plans; (ii) periodically monitor implementation of the work plan and chart their progress; (iii) ensure balanced implementation with respect to progress on each component; (iv) formulate recommendations of an administrative, financial and technical nature to resolve any problems that may arise; and (v) prepare the bidding documents, evaluate the bids received and recommend consulting services to the IICA.

## 4. Responsibilities of the participating DTs

- 3.8 The DTs in the MAG participating in the program will have the following responsibilities, among others: (i) coordinate with the DINCAP the procurement of all goods and services for the respective

components, and participate on the MAG permanent competitive bidding committee (CPL); (ii) participate in the CTCP; (iii) execute the technical activities of their respective components; and (iv) provide specialized technical support and perform the technical supervision for which they are responsible.

#### 5. Procurement procedures

- 3.9 The procurement of goods for the program will be carried out by the CPL in the MAG. The DINCAP, with the support of the CTOP, will prepare the bidding documents, evaluate the bids and participate in the committee's final decisions. Consulting services will be hired through the IICA, based on the technical recommendations of the CTOP (paragraph 3.7). All competitive bidding under the program will follow the Bank's procedures for the procurement of goods and the selection and hiring of consulting services.

#### 6. The specialized agency

- 3.10 Experience with the rural colonies consolidation program showed that the bureaucratic procedures for hiring the OTUs took over a year, jeopardizing achievement of the program objectives (paragraphs 1.32 and 1.33). Consequently, to expedite program execution, it is proposed that the IICA be hired directly, without competition, as provided for in the Bank's procurement policy (Procurement Manual, section GS-403), to perform the duties of hiring the specialized consulting firms and the OTU services, as well as to administer the respective contracts. Among the advantages of having the IICA carry out these activities are its extensive technical experience as an international agency supporting agricultural development, and its administrative capacity and flexibility. The IICA's autonomy would also reduce the risk of potential political and institutional changes in the sector. The IICA will use the Bank's standards and procedures set forth in the loan contract to hire the consulting firms and technical assistance. The IICA will be compensated using Bank funds (some 3.3% of the amount under its administration, i.e., US\$580,000 in phase 1 and US\$420,000 in phase 2). An agreement between the MAG and the IICA, according to parameters agreed upon with the Bank, will be entered into as a condition precedent to the first disbursement under the program.

#### B. Execution mechanism by component

##### 1. Pest control and monitoring system

- 3.11 Chaco monitoring network. The DDV, which will execute this subcomponent, is the agency responsible for plant health monitoring in the country. In order to achieve its objectives and prevent boll weevil dissemination in the Chaco area (western region), the program provides for strengthening the quarantine stations on the main access roads into the area, and the installation of traps for



controlling potential foci. In addition, controls will be applied to ensure the destruction of stubble after the cotton harvest.

- 3.12 Pest trap and monitoring network. This subcomponent would be executed by the DIA, which already operates a network of pest traps in the country. The existing network will be geographically distributed and expanded through the purchase of new traps to cover the country's eastern region. In addition, the DIA, in coordination with the DDV, will also supervise and support the technical personnel of the OTUs responsible for monitoring the trap network and inspecting the plants at the farm level. The DIA will systematize and process the information collected and distribute it to the DDV and other technical units of the MAG. DIA and DDV staff will be trained in monitoring techniques and consulting services will be hired to prepare a georeferenced information system to support decision-making in the use of IPM.
- 3.13 Quality control laboratory. Execution of this subcomponent will be the responsibility of the DDV. The program provides for the purchase of materials and equipment to strengthen the DDV laboratory in performing both preregistration analysis and quality control analysis of the plant health products marketed in the country, in order to remove from the market adulterated products or those which do not satisfy the requirements.
- 3.14 Validation of IPM technologies. This subcomponent will be executed by the DIA, which is the MAG unit responsible for agricultural research in the country. One vehicle, field materials and computer equipment will be procured for the DIA to evaluate the technologies used in IPM to determine their efficiency and make adjustments to better adapt them to the agroecological conditions in the OTUs' areas of activity.

## 2. Communications campaign

- 3.15 This component will be executed by the DEAG, which will carry out the following activities: (i) schedule and coordinate the training courses for teachers and audiovisual trainers; (ii) schedule and support the production of audiovisual teaching packages; (iii) provide technical support to OTU field personnel in the use of audiovisual equipment and carrying out producer training courses; and (iv) schedule and implement audio messages and teaching materials. Given the DEAG's lack of experience, an international consultant will be hired to support it in the operation of an audiovisual teaching system to train rural producers.
- 3.16 In addition, the DEAG will monitor the activities subcontracted to the private sector, and will evaluate the results achieved by the communications products prepared for the technology dissemination campaigns. In order to carry out these activities, the DEAG will

be supported by an outside consultant hired for one month at the end of each season.

### 3. Technical assistance

- 3.17 This component will be executed by the DEAG through OTUs hired to provide technical assistance and training. The OTUs will operate in 50 selected microregions in the country's eastern region. Of these, 25 will be incorporated in the first two years of execution (phase 1), and the remaining 25 in the third year (phase 2). The microregions to be served by the OTUs were selected by the MAG, taking the following into consideration: (i) a higher incidence of cotton pests; (ii) greater concentration of cotton producers; (iii) representativeness of the agroecological areas in the eastern region; and (iv) avoiding overlap with programs already under way.
- 3.18 Four departments will not participate in the program: Alto Paraná, because it is already covered by a technical assistance program financed by the World Bank; and Amambay, Cordillera and Central, because of the low number of cotton producers.
- 3.19 Based on a diagnostic study on each microregion (paragraph 3.25), the OTUs will prepare a technical assistance work plan in consultation with the beneficiaries. The plan will include activities to organize the purchase of inputs and the sale of products, and to facilitate technical assistance activities, and will include a technology package that will ensure adequate levels of productivity and sustainability of the production systems of small-scale cotton farms. The transfer of IPM, SCMP and crop rotation technologies will be emphasized in the context of production diversification and beneficiary participation. The beneficiaries will exercise social control over the advisory services provided by the OTUs, through the use of a methodology designed to ensure systematic supervision and control of the technical assistance services. They will also participate in the annual evaluation of the results achieved and preparation of the annual work plan.
- 3.20 Entities providing technical assistance will be hired through international competitive bidding for a four-year period, conditional upon the results of annual performance evaluations. The entities must demonstrate that all their field staff have full mastery of Spanish and Guaraní.
- 3.21 The field team comprising an OTU will consist of at least one coordinator with field experience in the transfer of technology, and five professionals, one of whom will be responsible for pest monitoring at the farm level. The team will initially assist 600 producers organized in groups the first year, increasing to 800 producers by the end of the third year.

a. Producer selection criteria

- 3.22 In order to gain access to direct technical assistance under the program, a producer must have: (i) a farm with an area of 1 to 20 hectares; (ii) a minimum of 80% of household income from agricultural activities; (iii) total annual production of less than 20 minimum wages; and (iv) cotton as a crop in at least one of the last three seasons.

b. Cost recovery

- 3.23 Most Paraguayan farmers are not familiar with technical assistance services (paragraph 1.22). The few beneficiaries of these services received them free of charge from the government. Furthermore, according to the study carried out by the UNDP, some 75% of the farmers who will benefit from the technical assistance are part of the population whose basic needs are unmet. Technical assistance is only justified insofar as it contributes to increasing small-scale farm household income. The program therefore calls for the beneficiaries to participate in the copayment of the cost of the services. At this time, it is projected that after the third year, at least 10% of the cost will be recovered, and that this percentage will increase annually.
- 3.24 Nevertheless, in order to better evaluate the ability to pay of small-scale farmers, and the gradual increase in their contribution to system sustainability, consulting services will be hired to study alternatives that would make this objective feasible. The study will include, among other items, the possible impact of OTU services on small-scale farmer income, debt levels among the farmers, and feasible alternatives for them to participate in copayments of the services, by analyzing various systems and conditions: group or individual, fixed or variable participation, depending upon the type and cost of the services, collection mechanisms and type of contract.

c. Diagnostic study on the current situation, monitoring by independent technical group, and impact evaluation

- 3.25 Before the OTUs are hired, a diagnostic study will be carried out on the productive, socioeconomic and environmental status of the microregions to be included in the program. The findings will be used, among other purposes, to prepare the specific terms of reference to be included in the bidding documents and as the basis for the OTUs to prepare their work plans. The data will also be used to evaluate program impact and to measure OTU performance.
- 3.26 Given the innovative nature of the proposed technical assistance mechanism, during its execution, information on production, and the socioeconomic and environmental situation will be collected for use in measuring program impact. In addition, a follow-up and review of the quality of the technical assistance provided to producers

will be carried out, including the organizational approach and strategy adopted, the effectiveness of the beneficiary participation mechanisms, etc. Analysis of the information will allow corrective measures to be taken with respect to performance of the OTUs and the program as a whole. At the end of each season, a summary will be prepared of the main conclusions and recommendations, as well as the results of any corrective measures taken. The reports will serve as the basis for a mid-term and ex post evaluation of the program.

- 3.27 It is proposed that the diagnostic and follow-up studies be carried out by the School of Agricultural Sciences (FCA) of Asunción National University, so that experience gained from the program can be incorporated into the training of future professionals involved in the country's agricultural development. This FCA is the only school in the country with the existing technical capacity in forestry sciences, veterinary medicine, agronomy, agricultural economics and human ecology, with a staff of qualified professionals with masters and doctoral degrees from various countries. From an administrative standpoint, the FCA has the legal capacity to sell the goods and services it produces, with full administrative and financial autonomy. It is therefore proposed that the FCA be directly hired, as provided for in the Bank's procurement policy, to carry out the independent diagnostic and follow-up studies under the program. Within six months after program initiation, the executing agency will submit evidence that the FCA has been hired to carry out the above activities, according to terms of reference agreed upon with the Bank. The cost of the studies is estimated at US\$1.1 million for phase 1 and US\$700,000 for phase 2.

#### 4. Seed improvement

- 3.28 The DISE will be the unit responsible for executing this component and will carry out the following basic activities: (i) schedule the activities to be included in the program's annual work plans; (ii) supervise seed production by medium-sized and large producers; (iii) supervise the OTUs that will be advising and overseeing small-scale producers of improved seeds; (iv) act as liaison with the DIA to ensure the production of basic seeds with appropriate genetic material in the quantities demanded by the seed-producing private sector; and (v) conduct the training courses. At the end of the second year of program execution, the DISE will present a report evaluating the system implemented for charging a fee for seed certification and the results achieved.

#### C. Annual work plans

- 3.29 Operation of the program and its components will be based on the annual work plans which the DINCAP, with the support of the decentralized supervisory offices and the MAG DTs, will prepare and submit to the Bank for consideration during the program execution

period. The plans will present the activities, goals, investments and activities for each program component separately, as well as consolidated investment tables, using the categories shown in Annex A to the loan contract. After the second season under the program, in addition to the annual work plans, the results of the performance evaluation corresponding to the preceding plan will also be presented.

D. Operating Regulations

- 3.30 The program Operating Regulations agreed upon with the Bank define the responsibilities of the DINCAP and each participating entity, and establish the operating rules and procedures to be followed during the course of program execution. All procurement of goods and the hiring of specialized consulting services called for under the program will be governed by the Bank's procedures, which will be part of the Operating Regulations. Entry into force of the Operating Regulations previously agreed upon with the Bank will be a condition precedent to the initial disbursement.

E. Execution period and disbursement schedule

- 3.31 The proposed execution period for the entire project will be six years. Phase 1, the loan for which would be approved on the basis of this document, will have a disbursement period of five years, and phase 2, to be submitted to the Board of Executive Directors for consideration at a later date, will be initiated, if approved, during year three of phase 1. Phase 2 will have a disbursement period of four years (paragraph 2.1).
- 3.32 After completion of the second season of phase 1 and disbursement of at least 50% of the financing, the Bank and the executing agency will perform a mid-term program evaluation. The basis for this evaluation will be the semiannual progress reports and the performance evaluations to be prepared (paragraph 3.26). After achieving satisfactory progress in fulfilling the goals established in paragraph 3.41, especially the number of OTUs hired, producers reached, seeds certified, traps installed and operating in the eastern region, and audio messages produced and disseminated, Management will submit phase 2 to the Board of Executive Directors for consideration.
- 3.33 The disbursement schedule established for the program is shown in the following table, and is consistent with the MAG's current execution capacity and the availability of local counterpart funds. It should be noted that in the event that the PROMODAF enters into operation, execution of the proposed program would be adjusted to the new sector structure and should not experience any delays.

DISBURSEMENT SCHEDULE In thousands of US\$							
SOURCE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	TOTAL
PHASE 1							
IDB/OC-IFF	6,850	5,483	5,024	4,880	3,413	-	25,650
LOCAL	489	560	562	581	658	-	2,850
SUBTOTAL	7,339	6,043	5,586	5,461	4,071	-	28,500
%	25.8	21.2	19.6	19.2	14.3	-	100.0
PHASE 2							
IDB/OC-IFF	-	-	4,063	3,895	3,821	4,601	16,380
LOCAL	-	-	362	362	362	734	1,820
SUBTOTAL	-	-	4,425	4,257	4,183	5,335	18,200
%	-	-	24.3	23.4	23.0	29.3	100.0
PHASES 1 + 2							
IDB/OC	6,850	5,483	9,087	8,775	7,234	4,601	42,030
LOCAL	489	560	924	943	1,020	734	4,670
TOTAL	7,339	6,043	10,011	9,718	8,254	5,335	46,700
%	15.7	12.9	21.5	20.8	17.7	11.4	100.0

F. Bidding conditions and schedule

- 3.34 This program does not include investments for the construction of infrastructure works. The procurement of goods and the hiring of specialized consulting services using program resources will be carried out in accordance with Bank procedures. International competitive bidding will be mandatory for procurement in amounts equal to or greater than US\$250,000 for goods or US\$200,000 for consulting services. With these thresholds, some 90% of the procurement scheduled for phase 1 of the program will require international competitive bidding. For amounts below the above thresholds, the procedures will be based on national legislation, provided that this is compatible with the Bank's procedures. Contracts for goods and services will be grouped as specified in the procurement schedule attached s Annex III-1.

G. Revolving fund

- 3.35 As set forth in the new procedures for advances, the Bank will advance 5% of the loan amount in the form of a revolving fund. A review of DINCAP operations shows that the comments prepared by the independent external auditing firm and by the Bank supervisors were minor exceptions, and were taken into consideration in a timely manner, with the adoption of the necessary administrative and financial measures.

- 3.36 The above notwithstanding, given the imminent change of government it is recommended that only after the mid-term evaluation should consideration be given to adopting the system for ex post review of advances.

H. Environmental considerations

- 3.37 The program's environment and social impact brief was approved by the Committee on Environment and Social Impact (CESI) on November 17, 1997. The environmental impact studies for the program were disclosed to the public on March 10, 1998. The environment and social impact report on the program was considered by the CESI on April 24, 1998 and forwarded to the Public Information Center on April 30, 1998.
- 3.38 The environmental impact studies conducted concluded that almost all the impact generated by the program would be beneficial to the environment and the socioeconomic status of small-scale cotton producers. The proposed environmental management plan will seek to strengthen this impact. During program execution, environmental specialist will be hired in the DINCAP and a water quality monitoring program carried out in selected water courses. The program also calls for a general follow-up of its execution, including environmental impact to be conducted by an independent group hired by the DINCAP. The CESI specifically recommended emphasizing activities for technical assistance and training in pesticide management, as well as in the management of toxic substances by the proposed laboratory.

I. Program supervision and monitoring

- 3.39 Program execution will be supervised and monitored through the Bank's Country Office in Paraguay. The executing agency will submit to the Bank an initial report that must include an update of the logical framework (Annex III-2). It will also submit to the Bank semiannual progress reports that will serve as the basis for program management. These must contain at least an updated, detailed execution schedule for the various component activities, including an analysis of any problems affecting their execution, the respective corrective measures taken, and the schedule for the next semiannual period. In the event that program execution is not found to be satisfactory, within a period of 60 days after the Bank's recommendation, the executing agency must submit to the Bank the corrective measures it will take and a timetable for their implementation.

J. Audits

- 3.40 The program's financial statements will be audited by independent auditors acceptable to the Bank and must be submitted to the Bank within 120 days after the close of the government's fiscal year, throughout program execution period. In addition to issuing their opinion on the program's financial statements, the auditors will

issue an opinion on fulfillment of the financial clauses of the loan contract with the Bank. These audits will be financed with the proceeds of the loan.

K. Program performance indicators

- 3.41 Fulfillment of the program's goals will be evaluated through the logical framework indicators, the most important of which are the following:

INDICATORS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
OTUs hired	10	25	50	50	50	50
Beneficiaries (producers)	6,000	16,000	35,000	37,500	40,000	40,000
Household income (US\$)	1,230	1,260	1,310	1,370	1,420	1,470
Cotton productivity (kg/ha)	1,300	1,330	1,360	1,400	1,450	1,500
% of producers with over 4 applications of pesticides	60	56	45	30	20	10
No. of traps installed and operating	1,200	1,600	2,300	2,300	2,300	2,300
Quarantine posts installed in Chaco	3	3	3	3	3	3
No. of plant health products analyzed	50	200	350	500	650	800
Certified seed (%)	30%	60%	80%	100%	100%	100%
Training packages produced	8	20	35	50	65	75
Audio messages produced and disseminated	20	70	130	210	290	370
Audiovisual messages produced	20	40	70	100	130	160
Number of audiovisual trainers trained	25	50	125	125	125	125
IPM technology validation fields	20	40	60	80	100	100
Traps installed in Chaco	300	300	300	300	300	300

L. Ex post evaluation

- 3.42 It was agreed that the MAG, through the DINCAP, will perform an ex post evaluation of the program within three years after the final disbursement of the program.

M. Data collection

- 3.43 The executing agency will assign responsibility to the FCA for collecting and processing the data required for the ex post evaluation. The data will be forwarded to the Bank in annual reports after the second year of execution until three years after completion. Twelve months after signature of the loan contract, the executing agency will present a report to the Bank with a list of data and a detailed description of the methodology that it will use in the data collection and processing.



#### IV. PROGRAM FEASIBILITY

##### A. Technical feasibility

- 4.1 The proposed program is considered technically feasible since the MAG technical offices have the integrated pest management and soil conservation and management technology which, properly implemented and validated with the support of the program, can be adapted to local agroecological conditions and widely disseminated. The program will address the MAG's main weakness in transferring such technologies to producers, by hiring the OTUs. In addition, the activities in the pest monitoring and control component will consist of intensification and expansion of the tasks that the DIA and the DDV are already carrying out, with the support of specialized consulting firms, and no difficulties in their execution are therefore anticipated.
- 4.2 Execution of the other program components is also technically feasible, for the reasons indicated below: (i) Improved seed. The actions provided for in this component are designed to strengthen the private sector as the party responsible for seed production in Paraguay. Both the Paraguayan Association of Seed Producers and the government have agreed to change the current seed procurement and distribution system within a five-year period, establishing free trade for farmers, which will stimulate companies to compete for the market through a better quality product; (ii) Communications. In order to address the country's lack of experience in disseminating information to rural producers, national experts in this area will be trained through short courses (two months' duration). International companies with experience in this area may also be qualified to produce the communications materials needed for the program.

##### B. Institutional feasibility

- 4.3 The execution mechanism proposed by the MAG through the DINCAP, which includes the IICA and the FCA, has an organizational structure and internal control procedures that are appropriate for executing this program. The DINCAP also has the necessary capacity to carry out program monitoring and oversight, as well as administrative, accounting and financial management, scheduling and supervision of the planned activities, during program execution. It should be noted that the review of the DINCAP operations shows that the comments prepared by the independent external auditor and the Bank's supervisors were minor exceptions, which were taken into consideration in a timely manner with the adoption of the necessary administrative and financial measures.
- 4.4 The IICA's support will expedite the hiring of the services needed for the program, and the FCA will carry out the microregion

diagnostic and follow-up studies, the independent review, and data collection to measure the program's impact. No technical difficulties are expected at the level of the MAG DTs participating in the program, since specialized technical consulting services have been included for areas of greater specialization.

- 4.5 The technical assistance activities for producers will be executed by private-sector companies hired through international competitive bidding to provide the technical teams organized into OTUs. There are currently 25 NGOs, some private development companies, and university foundations in the country directly involved in rural small-scale farm development, with a reasonable level of experience in the transfer of production technology, participatory research and marketing. At the country level, there is a sufficient number of organizations to meet the goal of hiring 50 OTUs during the first three years of program execution. Moreover, international companies have expressed interest in participating in bidding to provide OTUs.

C. Financial feasibility

- 4.6 Total local counterpart funding requirements for the program will be US\$4.67 million (US\$2.85 million in phase 1 and US\$1.82 million in phase 2), distributed over a six-year period. The maximum contribution, in the amount of US\$1 million, will be required in the sixth year of program execution. This amount represents some 1% of the MAG's annual budget performance for the past three years (over US\$100 million per year), and some 4% of the investment budget for the current year. Consequently, no difficulties are anticipated in the timely availability of national counterpart funds for the program.

D. Socioeconomic feasibility

- 4.7 The program will provide technical assistance to 40,000 cotton producers at an approximate cost of US\$200/producer/year. The technical assistance will consist primarily of two integrated technology packages: IPM and SCMP. The socioeconomic impact analysis focuses on producers directly assisted by the program and is based on the calculation of increased household income, increased labor productivity, increased production and the economic internal rate of return.

1. Integrated pest management (IPM)

- 4.8 The proposed IPM technology includes 10 main activities divided into two groups: group A, comprising: (i) destruction of stubble; (ii) coordination of the planting season (iii) control of the edges or borders; (iv) boll weevil killing tubes; and (v) early soil preparation; and group B, comprising: (i) collection of flower buds; (ii) sampling (iii) crop rotation; (iv) trap installation; and (v) planting with quick-maturing varieties.

- 4.9 The basic situation as reflected in the data from a survey of 1,250 cotton producers in the country's eastern region in February 1997 by the MAG Statistics and Census office indicates that the rate of adoption of IPM practices is extremely low. The collection of flower buds, for example, is not practiced in nine of the 20 districts studied, and only in one district is it practiced by over 20% of producers. Moreover, there was not a single producer in the entire sample who followed all the IPM recommendations, and almost 61% of them applied a quantity of pesticides greater than what would be economically and environmentally desirable.
- 4.10 Adoption of all the practices (groups A and B) would help reduce the number of pesticide applications, which exceeds four per year, and for producers that adopt only group B practices, exceeds six. Given that producers who would participate in the program are not selected according to the number of applications, those that apply four or less contribute to the costs of the technical assistance and do not benefit from the IPM. Part of the benefits of the IPM derive from the savings that producers would achieve by adopting the recommended practices (each application costs some US\$16.51 per hectare).
- 4.11 The land area cropped with cotton per producer affects the costs per hectare of the technical assistance, and therefore the rate of return of the program. In the evaluation, an average of 2.4 hectares per producer was adopted (data from 1995/1996).

## 2. Soil conservation and management practices (SCMP)

- 4.12 The soil conservation and management practices recommended in the program use green manure, along with crop rotation, and are considered one of the best alternatives for small-scale producers to maintain and increase soil productivity. SCMP also has high levels of synergy for the control of cotton pests and does not require significant cash investments. The use of green manure can reduce the labor requirements and the costs of disease control and keeps the soils covered, protecting them from high temperatures and intense rain.
- 4.13 The results obtained during three years of validation at an experimental station in Paraguay showed that a corn-*mucuña*/cotton rotation allowed increased cotton yields by 55% in the second year of the rotation and increased corn yields by 30% in the third year, compared with the traditional system without using green manure. At the rate of adoption used for the GTZ-financed San Pedro Norte project, yields would have increased by 30%. The economic analysis assumed that adopting both IPM and SCMP would lead to a 30% increase in cotton and corn yields.
- 4.14 The technological options for restoring degraded soils with at least 1% of organic material require high fertilizer costs during

the first three years and the application of lime during the first year. Because of the financial situation of small-scale producers, it was considered unlikely that this option could be adopted by a significant number of producers and it would not have a significant impact on the feasibility of the program.

### 3. Cost-benefit analysis

- 4.15 The main economic benefit of IPM is associated with a reduced number of pesticide applications and the consequent savings. In the case of the SCMP, this benefit stems from the increased productivity of cotton and corn (part of the crop rotation) and lower labor for weeding. Because there are no significant distortions in international trade in products and inputs and the price of the currency is strongly influenced by the informal economy, no adjustments were made to market prices.
- 4.16 The program's cost-benefit analysis was carried out for both the IPM and SCMP, and took into consideration three scenarios in the adoption of the recommended technologies, as shown in the following table:

Rate of technology adoption		Scenario		
		Worst case	Intermediate case	Best case
IPM	Group A	50.0%	60.0%	70.0%
	Group B	20.0%	30.0%	40.0%
SCMP		15.0%	30.0%	45.0%
Increased productivity		15.0%	30.0%	45.0%
EIRR		11.7%	16.5%	24.2%

- 4.17 The economic internal rate of return (EIRR) for the program at the aggregate level ranges from 11.7% and 24.2%, depending on the levels of adoption and the expected increase in yields. In the intermediate case, i.e., the expected value, the EIRR is 16.5% and the net present value (NPV) is US\$42.32 per hectare.

### 4. Impact on household income and labor productivity

- 4.18 The program impact on household income and labor productivity was calculated on the basis of a production function estimated using data from the survey carried out in February 1997. Cotton producers that adopt the IPM and SCMP techniques (in rotation with corn) would increase their household income by some 11%, from US\$1,230 to US\$1,370. The labor productivity of these producers would increase by close to 13%. It should be noted that the increased labor productivity is a powerful incentive for adoption of the program's recommended technology.

## 5. Impact on the cultivated land area and production

- 4.19 Based on data from the 1997 survey, a model was developed to simulate the program's potential impact on the cultivated land area and cotton production. The model takes into account the parameters characterizing the production technology, the prices of cotton, corn and wages in a competitive market, and pesticide prices established exogenously on the international market. It also takes into consideration the elasticity of the supply of labor and demand for the product. The results of the model show that given the cultivated land area, adopting IPM and SCMP practices would result in a small decline in cotton production (some 2%) and a 13.4% increase in corn production (because of the impact of crop rotation). The program also increases land and labor productivity, and consequently creates incentives for producers to increase the cultivated land area. In the best case of the analysis, the land area cultivated by small-scale farmers served by the program increased by 12.3%.
- 4.20 The demonstration effect of the technologies disseminated through technical assistance and messages disseminated by the communications media, and the greater availability of quality seeds could create incentives to other producers to resume cultivating cotton as a source of income. Assuming that 75% of the land area and productivity goals are attained, national production would total some 470,000 tons/year by the year 2003.

### E. Analysis of the impact on low-income groups

- 4.21 The program would provide technical assistance to small-scale producers in the country's eastern region with farms smaller than 20 hectares and gross annual production of less than 20 minimum wages per family unit, or US\$350 per month. Given the net income (discounted from the costs of seeds and agrochemicals) and the average household size of the farms (five persons), it was concluded that almost all program beneficiaries would qualify as belonging to low-income groups. Furthermore, in accordance with income distribution studies in Paraguay, the percentage of families in rural areas under the poverty line ranges from 45.1% to 78.7%, compared with a rate of 12.3% to 55.4% in urban areas <sup>4/</sup>. For all these reasons, the program falls under the category of social equity and poverty reduction (AB-1704, paragraphs 2.13 and 2.15).

### F. Risks

- 4.22 Direct hiring of the OTUs and the various consulting firms by the MAG could delay execution of the program. The agreement to be

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<sup>4/</sup> Moreover, the departments with the most favorable income indicators (Alto Paraná, Cordillera and Central) are not included in the program for the reasons noted in paragraph 3.18.

entered into by the MAG and the IICA for the latter to hire all the specialized services and the technical assistance provided for under the program will reduce this risk.

- 4.23 The change in the central government administration of Paraguay, scheduled for August 1998, could imply a risk of delays in program execution. However, the economic and social importance of the program to the agricultural sector and to the country's very economy is a factor of considerable political weight that helps minimize the risk.

## TENTATIVE PROCUREMENT SCHEDULE

ITEM	PACKAGE	FINANCING %		TYPE	COST US\$ 000	TENTATIVE DATE (QUARTER/YEAR)
		IDB	LOCAL			
CONSULTING SERVICES						
01. INTEGRATED PEST MANAGEMENT	1/1	100		ICP	40	II/99
02. GEOGRAPHIC INFORMATION SYSTEM	1/1	100		ICP	40	II/99
03. PEST MONITORING SYSTEM	2/1	100		ICP	40	II/00
04. TECHNICAL ASSISTANCE (OTUs)	1/2 AND 1/3	100		RCP	14,400	III 98/99
05. DESIGN OF AGRICULTURAL SERVICES	1/1	100		ICP	50	IV 98
06. RURAL COMMUNICATIONS	1/1	100		RCP	240	IV 98
07. COMMUNICATIONS MONITORING AND SUPERVISION	1/1	100		ICP	50	IV 98
08. PRODUCTION OF COMMUNICATIONS PACKAGES	1/1	100		ICP	180	IV 98
09. TEACHING PACKAGES	2/1	100		ICP	170	IV 98/99
10. COPAYMENT STUDIES	1/1	86	14	ICP	140	IV 99
11. EX POST EVALUATION	1/1	80	20	ICP	150	IV 02
12. AUDIOVISUAL TRAINING COURSE	1/1	100		ICP	100	I 99
13. LOCAL ADVERTISING	SEVERAL	100		LCB	540	I 99/IV 03
14. TRAINING OF OTUs	SEVERAL	100		ICP	310	II 99/II 03
15. RURAL COMMUNICATIONS COURSE	1/1	100		ICP	190	II 99
<u>EQUIPMENT</u>						
01. COMPUTER SYSTEMS	2/1	100		LCB	225	I 99/00
02. PEST MONITORING MATERIALS	SEVERAL	100		ICB	780	II 99/02
03. VEHICLES	1/1	100		LCB	245	II 99
04. EQUIPMENT FOR SUPERVISION	2/1	100		LCB	290	I 99/01
05. LABORATORY EQUIPMENT AND MATERIAL	2/1	100		ICB	380	I 99/00
06. TECHNOLOGY VALIDATION EQUIPMENT	2/1	100		LCB	180	II 99/01
07. COMMUNICATIONS EQUIPMENT	1/1	100		ICB	375	I 99

ICB: international competitive bidding

ICP: international call for proposals

LCB: local competitive bidding

RCP: restricted international call for proposals

## LOGICAL FRAMEWORK

Objectives	Indicators	Means of Verification	Assumptions
<b>OBJECTIVE:</b>			
To promote the sustainability of small-scale cotton production systems, improving their net income.	Net income of producers increases from US\$1,230 to US\$1,370 in 4 years.	Follow-up report by independent group; program impact analysis of and annual evaluation report of the OTUs and direct survey of beneficiaries.	No changes in government priorities. The prices of the inputs used and the agricultural products do not change.
<b>PURPOSE:</b>			
1. Reduce production costs caused by cotton pests through IPM.	At least 30% of producers adopt IPM in year 1 and at least 60% by year 3.	Follow-up report by independent group; data for program impact analysis; production statistics.	
2. Increase cotton productivity through seed improvement and use of IPM and SCMP.	Productivity increases from 1,300 kg/ha to 1,500 kg/ha in 6 years.		
3. Improve the environment by reducing the unnecessary use of pesticides.	% of producers using more than 4 applications of pesticides drops from 60% to 10% in 6 years.		
<b>COMPONENTS</b>			
1.1 The Chaco area remains free of the boll weevil.	Traps do not capture any weevils.	Program completion report.	
1.2 OTU technical staff use data on the density of weevils and other cotton pests to carry out their work.	Number of weevils captured by traps; quantity and variety of cotton pests identified.	OTU work plan, program progress report, DIA reports.	
1.3 Plant health products sold in this country are of good quality.	In 5 years, the number of poor quality plant health products is reduced by 70%.	Program progress report.	
1.4 New IPM technologies are evaluated and validated.	By the end of year 4, at least 60% of the producers use new IPM technologies	DIA report and program progress report.	
2.1 Communications campaigns on IPM technologies disseminated by appropriate media in Spanish and Guaraní.	Technology dissemination material produced and producers informed about IPM.	Program progress report.	
3.1 Cotton producers receive direct technical assistance through the OTUs in IPM, SCMP and crop rotation practices.	Producers receive information on IPM and SCMP through the OTUs and the mass media.	Program progress report.	



Objectives	Indicators	Means of Verification	Assumptions
4.1 Cotton seeds sold in the country are of good quality.	Bags of seeds with DISE certification.	Bags of seeds, program progress report.	
<b>ACTIVITIES</b>			
1.1.1 Chaco monitoring system implemented and operating.	Three quarantine stations installed and operating.  300 traps with weevil pheromones installed and monitored weekly to detect the infestation.  Cotton stubble destroyed.	Stations installed and program progress report  Network of traps installed and trap readings recorded.  DDV stubble destruction certification and DDV reports	
1.21 Cotton pest trap and monitoring network implemented and operating	Number of traps installed: year 1, 1,200; year 2, 1,600; year 3, 2,300;  years 4 and 5: 2,300.	Program progress report and trap readings recorded	
1.3.1 Plant health product quality control laboratory implemented and operating	Data on pest density and type tabulated and distributed by the DIA.  Number of analyses carried out: year 1: 50, and after year 2, at least 150.  Poor quality plant health products taken off the market.	Trap readings recorded and DIA report  DDV report and program progress report  DDV report.	
1.4.1 System for validating the installed IPM technologies.	100 IPM technology validation fields implemented in 5 years.	Program progress report and DIA report.	
2.1.1 Technical staff trained in rural communications packages production and processing methodologies.	18 audiovisual teachers trained year 1; 25 audiovisual trainers trained year 1, 25 in year 2, and 75 in year 3.	Technical staff trained and program progress report	
2.1.2 The DEAG provides technology packages to disseminate to producers.	8 technology packages produced in year 1; 12 in year 2 and 15 annually, beginning in year 3.	Technology packages available and program progress report	
2.1.3 The DEAG provides audio messages to disseminate to producers.	20 audio messages produced in year 1; 50 in year 2; 60 in year 3, and 80 thereafter.	Program progress report	
2.1.4 The DEAG provides audiovisual messages to disseminate to producers.	20 audiovisual messages produced in year 1; 20 in year 2; 30 in year 3, and 40 thereafter.	Program progress report  Contracts signed and program progress report	

Objectives	Indicators	Means of Verification	Assumptions
3.1.1 OTUs are hired to provide technical assistance services.	10 OTUs hired year 1; 15 in year 2, and 25 in year 3.	Program progress report.	Obstacles to timely hiring of outsourced technical assistance are eliminated.
3.1.2 Producers are directly assisted by the OTUs.	6,000 producers assisted by year 1; 16,000 by year 2; 35,000 by year 3; 37,500 by year 4, and 40,000 by years 5 and 6.	Program progress report	
4.1.1 The cotton seed certification system is implemented.	Registration of seed producers implemented.  Certified seed: 30% by year 1; 60% by year 2; 80% by year 3; and 100% by year 4.	Record of seed producers and program progress report.	

**PROPOSED RESOLUTION**

**PARAGUAY. LOAN /OC-PR TO THE REPUBLIC OF PARAGUAY  
(Support Program for Small Scale Cotton Producers)**

**The Board of Executive Directors**

**RESOLVES:**

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Paraguay, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a support program for small scale cotton producers. Such financing will be for the amount of up to twenty five million six hundred fifty thousand dollars of the United States of America (US\$25,650,000), which are part of the Single Currency Facility of the Ordinary Capital resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.

LEG/RE1/PR-0164

PR-0082

Original: Spanish

## PROPOSED RESOLUTION

### PARAGUAY. PARTIAL PAYMENT OF INTEREST LOAN /OC-PR TO THE REPUBLIC OF PARAGUAY (Support Program for Small Scale Cotton Producers)

The Board of Executive Directors

#### RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank as administrator of the Intermediate Financing Facility Account, hereinafter referred to as the "account", to enter into such contract or contracts as may be necessary with the Republic of Paraguay as Borrower, and to adopt other pertinent measures to use the resources of the account to pay a part of the interest due by the Borrower on outstanding balances of the loan authorized in the Resolution DE / , in accordance with the provisions set forth in Document FN-263-2, as amended, approved by the Board of Executive Directors on December 21, 1983.

This resolution will take effect only if the Bank determines that it has sufficient resources available, for the Republic of Paraguay, in the Account of the Intermediate Financing Facility, in accordance with Resolution DE-\_\_\_/\_\_\_.