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DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

REPUBLIC OF PARAGUAY

CONDITIONAL CREDIT LINE FOR INVESTMENT PROJECTS (CCLIP) TO FINANCE SUPPORT FOR AGRICULTURAL PUBLIC SERVICES AND IMPROVED PRODUCTIVITY

(PR-O0003)

AND

FIRST INDIVIDUAL PROGRAM TO FINANCE THE IMPROVEMENT OF AGRICULTURAL RESEARCH, INNOVATION, AND TECHNOLOGY TRANSFER IN PARAGUAY

(PR-L1162)

LOAN PROPOSAL

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CONTENTS

ANNEXES	
Annex I	Development Effectiveness Matrix (DEM) – Summary
Annex II	Results Matrix
Annex III	Fiduciary Agreements and Requirements

REQUIRED LINKS	
1.	Multiyear execution plan / Annual work plan
2.	Monitoring and evaluation plan
3.	Procurement plan

OPTIONAL LINKS	
1.	Ex ante economic evaluation
2.	Bibliographic references
3.	Strategic lines of research
4.	Institutional improvement plan
5.	Technology transfer strengthening plan
6.	Research center infrastructure and equipment
7.	Strategic lines of research sheets
8.	Agricultural sector framework
9.	Environmental and social analysis
10.	Operating Regulations
11.	Climate change

ABBREVIATIONS

AWP	Annual work plan
BECAL	Becas de Postgrados en el Exterior Don Carlos Antonio López [Don Carlos Antonio López Postgraduate Scholarships Abroad]
CAN	Censo Agrario Nacional [National Agricultural Census]
CCLIP	Conditional credit line for investment projects
CONACYT	Consejo Nacional de Ciencia y Tecnología [National Science and Technology Council]
DEAG	Dirección de Extensión Agraria [Agricultural Extension Directorate]
DGAF	Dirección General de Administración y Finanzas [Directorate-General of Administration and Finance]
DNCP	Dirección Nacional de Contratación Pública [National Public Procurement Directorate]
ESA	Environmental and social analysis
ESMP	Environmental and social management plan
FAO	Food and Agriculture Organization
FFF	Flexible Financing Facility
GHG	Greenhouse gas
ICAS	Institutional Capacity Assessment System
ICB	International competitive bidding
IPTA	Instituto Paraguayo de Tecnología Agraria [Paraguayan Institute for Agricultural Technology]
IRR	Internal rate of return
LAC	Latin America and the Caribbean
MAG	Ministerio de Agricultura y Ganadería [Ministry of Agriculture and Livestock]
MERCOSUR	Mercado Común del Sur [Southern Common Market]
OIE	International Office of Epizootics
PEU	Program execution unit
SCSP	Sistema de Contrataciones Pública de Paraguay [Public Sector Procurement System]
SENAVE	Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas [Plant and Seed Quality and Health Service]
SIAF	Sistema Integrado de Administración Financiera [Integrated Financial Administration System]
SICO	Sistema de Contabilidad [Accounting System]
SICP	Sistema de Información de Contrataciones Públicas [Public Procurement Information System]
SIGEST	Sistema Integrado de Gestión para el Desarrollo Agropecuario y Rural [Integrated Management System for Agricultural, Livestock, and Rural Development]
SNC	Servicio Nacional de Catastro [National Cadastre Service]
WAL	Weighted average life

PROJECT SUMMARY

PARAGUAY

CONDITIONAL CREDIT LINE FOR INVESTMENT PROJECTS (CCLIP) TO FINANCE SUPPORT FOR AGRICULTURAL PUBLIC SERVICES AND IMPROVED PRODUCTIVITY (PR-O0003)

FIRST INDIVIDUAL PROGRAM TO FINANCE THE IMPROVEMENT OF AGRICULTURAL RESEARCH, INNOVATION, AND TECHNOLOGY TRANSFER IN PARAGUAY (PR-L1162)

<table>
<tr><th colspan="5">Financial Terms and Conditions</th></tr>
<tr><td colspan="3">Borrower:</td><td colspan="2">Flexible Financing Facility[a]</td></tr>
<tr><td colspan="3">Paraguayan Institute for Agricultural Technology (IPTA)</td><td>Amortization period:</td><td>22.75 years</td></tr>
<tr><td colspan="3">Guarantor:</td><td>Disbursement period:</td><td>6 years</td></tr>
<tr><td colspan="3">Republic of Paraguay</td><td>Grace period:</td><td>7.75 years[b]</td></tr>
<tr><td colspan="3">Executing agency:</td><td>Interest rate:</td><td>LIBOR-based</td></tr>
<tr><td colspan="3">Paraguayan Institute for Agricultural Technology (IPTA)</td><td>Credit fee:</td><td>[c]</td></tr>
<tr><td colspan="3">Liaison unit:
Ministry of Agriculture and Livestock (MAG)</td><td>Inspection and supervision fee:</td><td>[c]</td></tr>
<tr><td>Source</td><td>CCLIP (US$)</td><td>1st Operation (US$)</td><td rowspan="2">Weighted average life (WAL):</td><td rowspan="2">15.25 years</td></tr>
<tr><td>IDB (OC):</td><td>US$80 million</td><td>US$20 million</td></tr>
<tr><td>Total:</td><td>US$80 million</td><td>US$20 million</td><td>Currency of approval:</td><td>United States dollars</td></tr>
<tr><th colspan="5">Project at a Glance</th></tr>
<tr><td colspan="5">Project objective/description: CCLIP: To improve agricultural productivity through investments that build the capacity of the Paraguayan government to provide quality public agricultural services to producers.
First individual operation: To help increase the productivity and environmental sustainability of the agriculture sector by strengthening the country’s capacity to develop and transfer technology.</td></tr>
<tr><td colspan="5">Special contractual conditions precedent to the first disbursement of the loan: (i) the program execution unit (PEU) has been created, and key staff have been assigned or hired for the PEU project team, based on the terms of reference previously agreed upon with the Bank (see paragraph 3.3); and (ii) the program Operating Regulations have been approved on terms previously agreed upon with the Bank (see paragraph 3.4).</td></tr>
<tr><td colspan="5">Special contractual conditions for execution: None.</td></tr>
<tr><td colspan="5">Exceptions to Bank policies: An exception to the policy on Guarantees Required from the Borrower (document GP-104-2) is sought, whereby the sovereign guarantee of the Republic of Paraguay will apply solely to the monetary obligations of the loan, including the repayment of principal and payment of interest and fees (see paragraph 3.1).</td></tr>
<tr><th colspan="5">Strategic Alignment</th></tr>
<tr><td>Challenges:[d]</td><td>SI ☐</td><td>PI ☑</td><td>EI ☐</td><td></td></tr>
<tr><td>Crosscutting themes:[e]</td><td>GD ☐</td><td>CC ☑</td><td>IC ☑</td><td></td></tr>
</table>

[a] Under the terms of the Flexible Financing Facility (FFF) (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, as well as currency, interest rate, and commodity conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

[b] Under the flexible repayment options of the FFF, changes to the grace period are permitted, provided that they do not entail any extension of the original WAL of the loan or the last payment date as documented in the loan contract.

[c] The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank’s lending charges, in accordance with the relevant policies.

[d] SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

[e] GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. Description and Results Monitoring

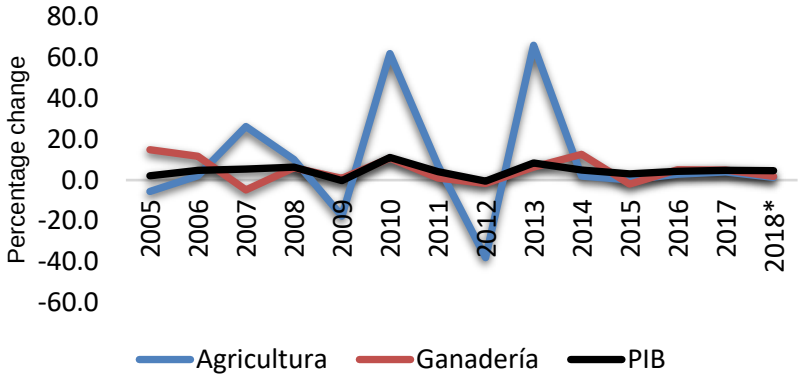
A. Background, problem addressed, and rationale

1.1 Paraguay's agricultural sector has experienced significant growth, positioning the country as a major global exporter in some agricultural subsectors, especially beef and soybeans. Although sector performance is encouraging, large gaps still remain in access to international markets and productivity, which are affecting its competitiveness. Historically, the Bank has assisted the country in agricultural sector reforms through individual investment operations with the particular aim of improving the management of support for producers (Program to Support Small-scale Cotton Producers (loan 1109/OC-PR) and Modernization of Agricultural Support Management (loan 1800/OC-PR)) and land management (Cadastre and Property Registry Program (loan 1448/OC-PR). Recently, the dialogue between the Government of Paraguay and the Bank has given rise to a long-term intervention strategy to address the challenges faced by the country's agricultural sector, resulting in a series of recently approved operations, including Implementation of the Project to Implement the Census and Agricultural Surveys System (loan 4423/OC-PR); Project to Improve and Expand Animal Health Services in Paraguay (loan 4526/OC-PR); and Project for the Improvement of the National Early Warning System for Hydrometeorological Events (loan 4646/OC-PR); as well as access to finance operations (CCLIP for Financing Productive Development (loan PR-X1006), the first operation under the CCLIP, Project to Improve and Expand Productive Sector Lending Products in Paraguay (loan 3616/OC-PR), and the second operation under the CCLIP, Access to Finance for Investments in Paraguay's Agriculture Sector (loan 4885/OC-PR)). This CCLIP will build upon and expand these operations.

1.2 **Importance of the agricultural sector.** Paraguay's economy is highly dependent on the performance of the agricultural sector. Figure 1 shows how GDP highs and lows coincide with the rise and fall of agricultural GDP. In 2018, agro accounted for 10.1% of GDP (7.9% crop farming and 2.2% livestock activities) and 11.1% of GDP, if forestry and fishing are added. Factoring in the agroindustry, the sector's total contribution would be in the order of 25% of GDP. The primary sector of crop and livestock farming and agricultural manufactures generated 43% of national exports (optional link 8). In terms of employment, the agricultural sector represents 20.7% of the country's workforce (24.2% of men and 15.3% of women) (Ongoing Household Survey, 2017). Primary production occurs on 289,000 production-oriented farms, operating on 32 million hectares of land, 91% of which (263,000) are smaller than 50 hectares (National Agricultural Census, 2008) and fall into the family farming category.[1]

[1] Family farming is a rural productive activity that relies mainly on the labor of family members for production on a plot of land and that, under no circumstances, whether owned, leased, or otherwise, uses more than 50 hectares of land in the eastern region and 500 hectares in the western region, regardless of productive activity.

Figure 1: Gross domestic product (growth rates)



Source: Central Bank of Paraguay (*), preliminary data.

1.3 **Sector performance.** The agricultural sector has experienced robust activity over the past few years based on the expansion of extensive farming (86% of the area sown in the 2015-2016 crop season was soybean, maize, and wheat) and beef production. Both grain and oilseed agriculture and beef have made a competitive foray into the international markets with significant expansion potential, currently limited by the sustainability of natural resources, especially soils. Technology adoption and technological adaptation (direct seeding, use of genetically modified crops and fertilizers) has been the engine behind this momentum, reflected in higher crop yields in certain subsectors and competitive costs, together with the efficient business organization of supporting services (Rocha and Villalobos, 2012). This agricultural development—for example, soybean, maize, and wheat exports grew from 6 million to nearly 10 million tons during the period from 2006-2007 to 2015-2016—was more recently accompanied by investments in agroindustrial processing that add value to production, reaching 25% of foreign direct investment in the past 10 years (Cresta and Velaztiquí, 2013). The soybean processing capacity in particular has doubled in the last decade. Cattle ranching, the other key economic activity in the agricultural sector, saw its stock rise from 7.6 million head of cattle in 1991 to 13.8 million in 2016. Meat exports, meanwhile, increased from US$52.5 million in 1994 to US$1.14 billion in 2016. The adoption of genetic technology, pasture seeding, and technical assistance, combined with compliance with international health standards, contributed to this growth.

1.4 **Access to markets.** International trade in agricultural products is governed by international[2] and country[3] phytosanitary standards that mitigate the risk of spreading pests, transmitting foodborne diseases, and introducing biological and chemical contaminants. In the case of exports from Paraguay to the European Union, for example, agricultural products were rejected in 17 instances during the

[2] World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures; Food and Agriculture Organization (FAO) Codex Alimentarius; Standards of the International Office of Epizootics (OIE) and the International Plant Protection Convention (IPPC).

[3] Food Safety Modernization Act of the U.S. Food and Drug Administration, European Union Regulation (EC) 178/2002 for foods, Directive 2000/29/EC for plant health, and others.

period 2016-2018.[4] According to the Doing Business report,[5] Paraguay has high transaction costs and long transaction times for trading across borders, ranking 127th out of the 190 countries evaluated. In particular, compliance with document requirements for export, which includes phytosanitary certificates, takes 24 hours, twice as long as in Brazil.

1.5 **Productivity.** Between 2003 and 2011, Paraguay posted an annual sector productivity growth rate of 3.8%, above the 2.4% average of Latin America and the Caribbean (LAC) and higher than such countries as Argentina, Uruguay, Brazil, and Bolivia. This growth was driven more by livestock productivity (3.7%) than production in crop farming subsectors (2.0%). For the period 2012-2016, Paraguay's annual agricultural productivity growth rate slowed (1.5%) but remained above the LAC average, ahead of Brazil and Uruguay but behind Argentina and Bolivia (Nin-Pratt, A., 2019).

1.6 **Sector challenges.** The specific challenges that the sector must address to improve productivity and market access are described below.

a. **Underdevelopment of family farming and heterogeneous productivity.** The sector's dynamic performance is not reflected in the universe of production units. Export-oriented agriculture (soybeans, maize, and wheat) shows rising yields, but gaps persist with respect to the region, and year-on-year variability is high (optional link 3). Family farming dedicated to sesame, cassava, sugar cane, kidney beans, and other crops has failed to support this process (Table 1). A decline in productivity has been observed in family farming production units, translating into lower yields and, therefore, lower incomes (Cresta et al., 2018; Willi, P., 2005; A-Fines and GIZ, 2014).

Table 1. Family and commercial farming yields in Paraguay by region (tons/ha)

Sector	Family farming			Commercial farming		
	Cotton	Sesame	Sugar cane	Soybean	Maize	Wheat
Paraguay	1.11	0.55	51.07	2.67	4.38	2.23
Gap with leading country	74%	60%	32%	10%	11%	25%
Leading LAC country	Mexico	Guatemala	Brazil	Brazil	Brazil	Argentina

Note: Prepared by the authors with FAOSTAT data, 2010-2017 average yields.

b. **Updated health and food safety status.** Between 2000 and 2016, global agricultural trade tripled in value (FAO, 2018), with an average annual growth rate of 6%. The region's economies have opened significantly in the past two decades, which brought them tariff reductions from food-importing countries but also exposed them to more paratariff barriers, such as sanitary and phytosanitary measures. Along with growth in global trade in agricultural products came stricter health and safety regulations in developed countries,

[4] Source: Rapid Alert System for Food and Feed (RASFF) and European Union Notification System for Plant Health Interceptions (EUROPHYT).

[5] World Bank, 2019.

creating new opportunities and challenges for food-supplying countries such as Paraguay. For example, Paraguay lost out on US$33 million in annual income as a result of classical swine fever (Giménez Rolón, 2012) until it was declared free of the disease in 2017 by the International Office of Epizootics (OIE). The new Regional Association Agreement between the European Union and MERCOSUR (Southern Common Market), establishing a free trade zone between the two markets, offers Paraguay the possibility of expanding trade with European Union countries, but the high animal and plant health standards pose a new challenge.

c. **Low legal certainty for land tenure.** According to the 2008 National Agricultural Census, more than 54% of the 289,000 farms in Paraguay have no formal property title or have incomplete ownership rights (the previous census from 1991 reported a similar percentage). The tenuous nature of ownership rights to land is even greater among small-scale farmers: just one in five farmers with fewer than 20 hectares holds formal title. Tenure issues, such as the overlap of ownership rights to the same property (in 70% of cases), physical overlap measured by the overlap index (land area registered divided by geographical land area), which averages 1.75 for the 209 districts, and the informal occupation of government-owned land (more than 210,000 squatters), are sources of significant risk for investment in agriculture.

d. **High sector volatility due to weather events.** Paraguay has the highest production losses in South America associated with weather events. According to the Germanwatch Climate Risk Index (2017), extreme weather events caused average annual losses of 0.75% of GDP between 1996 and 2015 (29th out of 180 countries in this category). The economic contractions of 2009 and 2012 are thus related, in part, to the effects of the drought that gripped the country and resulted in a 40% decline in annual soybean production (IDB, 2014a). Moreover, the effects of climate change will increase the average temperature and the occurrence of extreme events (drought and flooding), suggesting the need for action by the public and private sectors.

e. **Weak technical assistance and extension services.** Of the 289,000 farms included in the 2008 National Agricultural Census, only 44,000 report having received any technical assistance, and 35,000 of those have less than 50 hectares (13% of family farmers). Just 15,000 of these family farmers are served by the Agricultural Extension Directorate (DEAG) of the Ministry of Agriculture and Livestock (MAG); the rest receive assistance from the cooperative sector, financial institutions, and private technical specialists. A survey of family farmers in five departments (A-Fines and GIZ, 2014) found that 65.7% rate the DEAG service as not very useful or not useful.

1.7 To maintain good aggregate sector performance and improve the agricultural income of Paraguay's rural families, recent studies show the need to improve sector productivity through interventions that promote the use of better technologies among small-scale farmers, create greater diversification in production, and promote the introduction of production systems that enable better adaptation to climate risks, among other measures (Nin-Pratt, A. et al., 2017).

1.8 Special attention must be paid to the current institutional structure of the agricultural public sector and the orientation of public expenditure. The provision

of agricultural public goods or services such as health and safety, agricultural innovation, rural infrastructure, land titling, technical assistance and information services, the design and implementation of risk management mechanisms, and others are essential for the balanced, competitive development of the rural sector (optional link 8). Recent studies show that in Latin America and the Caribbean public investment in these types of services yields greater social returns than policies to provide direct supports (subsidies) to producers (Anriquez et al., 2016). The most recent Producer Support Estimate study for Paraguay reveals that public spending in the sector is low relative to GDP (0.9%) and is oriented less toward public goods or general services (45%) than direct supports (55%) (Cresta et al., 2018). Accordingly, considering the efficiency and effectiveness of public expenditure, there is room to restructure this expenditure toward the provision of public goods or services.

1.9 **First operation under the CCLIP: Agricultural innovation sector.** Knowledge of how productivity and its main drivers have evolved is important for the allocation of public resources. In the case of Latin America and the Caribbean, the evidence suggests that investment in agricultural research is closely tied to higher economic growth, agricultural development, and poverty reduction (IAASTD, 2009; IDB, 2010; Díaz-Bonilla, 2015). The development of new technologies (e.g., new seed varieties, breeding improvement, and agronomic techniques) and their adoption by producers improve resource use and increase productive efficiency, resulting in higher yields per hectare and aggregate production increases.

1.10 The literature shows a high return on investments in research and innovation. Bevrejillo, Alston, and Tumber (2012) developed a model on the effects of agricultural research in Uruguay, which they used to estimate marginal returns on research. These authors found a marginal cost-benefit rate greater than 40 and an internal rate of return (IRR) above 30%. Khan (2015) used a similar method for Australia and estimated a cost-benefit ratio of 10-20 and an IRR of 20%. In Argentina, Lema and Hermo (2018), with information from the National Agricultural Technology Institute (INTA), estimated an IRR between 6% and 12%, depending on the specifications defined, with cost-benefit ratios between 35 and 63 for the different scenarios.

1.11 The development of agricultural technology in Paraguay will have to factor in the challenges posed by climate change. To address the challenge of increasing production, LAC food systems must not only enhance their productive capacity but adapt it to new and changing weather conditions, including the risk of extreme weather events and a reduction in the sector's greenhouse gas (GHG) emissions. According to various simulation studies, without modifications to current production systems, climate change will reduce agricultural productivity (ECLAC, 2014; ECLAC, SICA, and SECAC, 2013; Descheemaeker, Zijlstra, Masikati, Crespo, and Homann Kee Tui, 2018; Hristov et al., 2018; Myers et al., 2017).

1.12 One climate change scenario projects that the eastern part of Paraguay, where most of the country's agricultural production is concentrated, will see a temperature rise of +1°C to +2°C by 2040, and as much as +3°C countrywide by 2070. This can have negative consequences for the sector, if no effective adaptation

measures are adopted.[6] In an agricultural sector responsible for 69% of GHG emissions in 2013, higher productivity with lower emissions is key, if the government is to achieve its target of 10% reduction in emissions by 2030 (NDC, 2015). Additionally, deforestation contributes to environmental degradation, increasing the fragmentation of soils and natural ecosystems, which leads to more frequent fires and less resilience, among other factors.[7]

1.13 **Paraguay's agricultural innovation.** Annual expenditure on agricultural research and development doubled during the period 2006-2013, reaching US$26.8 million (in 2011 PPP), trailing Bolivia (US$58.9 million), Uruguay (US$77.4 million), and Argentina (US$732.1 million). This means that Paraguay has one of the region's lowest intensity ratios (expenditure as a percentage of agricultural GDP) (0.26% of agricultural GDP in 2013 versus 1.29% in Argentina, 1.40% in Uruguay, and 1.82% in Brazil), as it relies heavily on technologies developed abroad, mainly in Brazil and Argentina. Meanwhile, 84% of the 2013 budget was allocated for the payment of wages and salaries, and just 13% for program and operating costs and 2% for investment. The number of researchers with doctoral degrees is also lower when compared with other countries in South America (5% versus 13% in Peru, 21% in Argentina, and 26% in Uruguay). In terms of products, the Paraguayan Institute for Agricultural Technology (IPTA) released 11 new crop varieties between 2007 and 2013, compared to Chile's 22, Uruguay's 132, and Argentina's 197.[8] In terms of publications in peer-reviewed journals, the IPTA published 15 papers between 2016 and 2018, whereas Uruguay's National Agricultural Research Institute (INIA), for example, published 100 in 2017 alone.

1.14 The Paraguayan Institute for Agricultural Technology (IPTA) was created by Law 3788 of 21 May 2010 as the result of the merger of the following MAG agencies: Agricultural Research Directorate, Animal Production and Research Directorate, and the Forest Research Unit of the National Forest Service. Its main objective is the generation, recovery, adaptation, validation, dissemination, and transfer of agricultural technology and the management of genetic resources to create technologies that raise the productivity of agricultural and forest production areas with a view to making them more competitive. It is an autonomous legal entity organized and operating under public law with its own assets, linked to the executive branch through the Ministry of Agriculture and Livestock (MAG). It has an Advisory Board with guidance and advisory functions and membership comprised of the MAG, trade unions, academia, the National Science and Technology Council (CONACYT), and a forestry sector representative, which offers suggestions, ideas, and proposals, as described in Article 21 of the IPTA Law (optional link 4).

1.15 The IPTA was created to strengthen and improve research systems for a more effective and efficient response in the technical and scientific development of the

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6 Economic Commission for Latin America and the Caribbean (ECLAC), 2014. "La economía del cambio climático en el Paraguay" [The economics of climate change in Paraguay].

7 Mereles, et al. (2014). "Assessment of rates of deforestation classes in the Paraguayan Chaco (Great South American Chaco) with comments on the vulnerability of forests fragments to climate change." Climatic Change 127(1): 55-71.

8 Agricultural Science and Technology Indicators report for Paraguay.

rural productive sector. However, the institutional consolidation process still has a number of weaknesses:

a. **Skilled human resources.** The IPTA has a low percentage of university professionals dedicated to research relative to the total staff (540). IPTA records show that 157 staff work in research, but in reality, there are no more than 70 researchers, who in many cases are also in need of further academic training (optional link 3 and optional link 4). The capacity to retain and promote talent is poor, as the remuneration system is not very competitive, particularly for more specialized positions, which affects knowledge creation.

b. **Inadequate facilities and equipment.** The Institute has good territorial coverage, with four research centers and seven experimental fields, but the facilities must be modernized based on the main lines of research to be developed (optional link 6).

c. **No strategy for prioritizing lines of research.** The IPTA originally began operations with 18 research programs in 2010. Today, there are 33, some with just one person not necessarily implemented on the basis of a rigorous scientific method. An effect of this situation is that the private productive sector currently has low demand for IPTA services (optional link 3). Also, in the absence of a scientific method, the validity of research program results is questionable.

d. **Organizational structure and governance.** There is no flexible, deconcentrated administration, and the administrative sector is centralized in Asunción. The organizational chart shows administrative fragmentation into 91 units at five levels (National Directorate, directorates-general, directorates, departments or coordination units, and centers and fields). In terms of governance, the Advisory Board has done little and added little value to the organization, so its impact has dwindled as an instrument for dialogue with the productive sector and for advisory services (optional link 4).

e. **No institutional business plan.** The IPTA has no strategy for drawing extrabudgetary income, as reflected in weak private-sector engagement[9] and the absence of partnerships with similar institutions of the region and major agricultural sector development actors (optional link 3 and optional link 4).

f. **Technology transfer and dissemination.** Technological activities and products have little visibility, either in the private sector or at other agricultural public sector institutions. Nor is there much linkage with MAG extension services and local institutional actors (optional link 5).

1.16 The IPTA has an Institutional Strategic Plan 2012-2021 and a Medium-term Plan 2017-2021 with the following objectives: (i) to strengthen the IPTA's institutional structure; (ii) to develop human talent and the management of knowledge of IPTA employees; (iii) to develop innovative, competitive, and sustainable technologies for the agricultural sector and the environment; (iv) to diversify sources of

[9] Two examples are (i) the Biotechnology Institute and (ii) the Paraguayan Grains and Oilseed Traders Association for the development of germplasm for soybean and wheat with high yield potential.

institutional financing; and (v) to develop strategies for the dissemination and transfer of the technologies created.

1.17 The fulfillment of the institutional strategic objectives and the identified weaknesses in the IPTA consolidation process require actions in the following two broad areas:

a. **Identification of strategic lines of research.** The improvement of strategic innovation capacities through the prioritization of lines of research will determine the infrastructure, equipment, and human resource needs. The first prioritization exercise, for the definition of program activities, was developed based on basic production systems: extensive farming, intensive farming, family farming, and livestock production. On the basis of this prioritization, strategic crosscutting areas of intervention are proposed, namely productivity growth, conservation of natural resources, adaptation to variability and climate change, and animal and plant health. Problems and opportunities for intervention, reflected in the lines of research, are identified in each strategic area. The various lines apply to subsectors in which the following are considered: (i) importance for exports; (ii) importance for domestic diet; (iii) importance for local food security; (iv) availability of knowledge not yet transferred and/or adopted; (v) IPTA stronghold over each subsector; (vi) size of yield gap; and (vii) potential impact on the yield/quality of the various subsectors. The prioritized subsectors were (i) soybean, wheat, rice, and horticulture, (ii) livestock, and (iii) forestry, in addition to the crosscutting areas of (i) quantification and simulation of the stock of carbon and emissions in agricultural and livestock systems; (ii) disease and pest management technology in extensive and intensive agricultural crops; and (iii) soil and irrigation management technologies. This prioritization also takes into account the fact that the IPTA is not the only institution that generates knowledge because there are various private-sector, cooperative, university, and other actors (optional link 3).

b. **Skilled human resources.** The definition of strategic lines of research for the IPTA implies having the necessary human resource capacity to execute them. Therefore, developing the skills of and providing training to the human resources already working within the IPTA, or to be hired for this project, are therefore essential for the Institute, which wants to achieve excellence in its technological and scientific products. The team of researchers must gain new discipline-related skills (in biotechnology, ecophysiology, phytopathology, entomology, biostatistics, and the like) in priority areas of knowledge to ensure the proper development of the strategic lines. To that end, the plan is to: (i) hire individual consultants with doctoral or master's degrees, for defined periods of time, in disciplines identified in the lines of research so that the corresponding research activities can be started right away; and (ii) train holders of doctoral and master's degrees using the country's current channels (cofinancing through the BECAL Program[10]), to give continuity to the prioritized lines of

[10] Don Carlos Antonio López National Postgraduate Scholarship Abroad Program (BECAL), which reports to the Office of the President of the Republic and is financed through loan 3491/OC-PR.

research. Also, the development of a career plan for researchers will improve researcher salaries and, as a result, help retain skilled researchers.

1.18 **The Bank's experience.** The Bank has provided the country with support through various operations in the sector, the most recent of which have been the following: Implementation of the Project to Implement the Census and Agricultural Surveys System (loan 4423/OC-PR); Project to Improve and Expand Animal Health Services in Paraguay (loan 4526/OC-PR); and Project for the Improvement of the National Early Warning System for Hydrometeorological Events (loan 4646/OC-PR). The project will include lessons learned, particularly from the following operations: Program to Strengthen Rural Public Goods (loan 2547/OC-ME); Project for the Improvement of the National Agricultural Innovation Program's Agricultural Innovation Strategic Services (loan 3088/OC-PE); Program to Strengthen the Agricultural Innovation System (loan 2412/OC-AR); and Scholarship Program (loan 3491/OC-PR). The table below summarizes the lessons learned relevant to the proposal's design.

Table 2. Lessons learned

Lesson learned	Reflected in the program design
Technological development for the purpose of resolving health threats is crucial to guarantee the sustainability of services and to increase productivity.	The operation includes the development of lines of research to address health-related issues, particularly in the cattle farming subsector.
Innovation services must be linked to technical assistance services and agricultural extension to improve adoption rates.	The program will provide training in connection with extension services and technical assistance on technologies to be developed in the innovation component.
The purchase abroad of research and test equipment will require local adjustments or adaptations, which delay procurement and/or commissioning processes.	Technical staff from the institution will be expected to conduct an in-depth analysis of the technical specifications and the adequacy of the necessary infrastructure in order to speed up bidding and equipment installation processes.
The hiring and retention of human resources by governmental innovation and research agencies is weak and requires a long-term effort.	A career plan for researchers is planned, in addition to results-based incentives, supplemented by doctoral and master's scholarships.
Appropriate management of the scholarship holder portfolio reduces accidents and improves the possibility of returning to the local labor market.	Under the operation, agreements are expected to be signed with researchers to encourage their reintegration into the institution once they complete their studies.

1.19 **Strategic alignment.** The CCLIP and the first individual operation are consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008) and are aligned with the development challenges of: (i) productivity and innovation, through their objectives to increase agricultural productivity and promote innovation. They are also aligned with the following crosscutting themes: (i) climate change and environmental sustainability, by promoting adaptation and mitigation actions through various technologies; and (ii) institutional capacity and rule of law, by strengthening public agricultural services. The project contributes to the following indicators of the Corporate Results Framework 2016-2019 (document GN-2727-6): (i) beneficiaries of improved management and sustainable use of

natural capital, by promoting technologies that foster improved productivity due to more sustainable use of natural resources; and (ii) farmers with improved access to agricultural services, by improving agricultural innovation services. The operation is consistent with the Agriculture and Natural Resources Management Sector Framework Document (document GN-2709-5), which proposes the provision of agricultural public goods as a mechanism for increasing productivity; the Food Security Sector Framework Document (document GN-2825-3), by contributing to greater food availability (productivity), access (family farm income), and stability (climate change resilience); the Integration and Trade Sector Framework Document (document GN-2715-6), by encouraging actions to increase production, and thus trade flows; and the Climate Change Sector Framework Document (document GN-2835-3), by financing research and promoting the use of technologies for climate change mitigation and adaptation. The operation is included in the Update to Annex III of the 2019 Operational Program Report (document GN-2948-2).

1.20 The operation is aligned with the Country Strategy with Paraguay 2019-2023 (document GN-2958), by contributing to the strategic objectives of building capacity in public management and promoting the international positioning of businesses. It is also linked principally to the guidelines and objectives of the National Development Plan 2030, the Agricultural Strategic Framework 2014-2018, and the Agricultural Strategic Plan 2014-2018 of the MAG, as well as the IPTA Institutional Strategic Plan 2012-2021, all of which share the objective of increasing the productivity, competitiveness, and environmental sustainability of agricultural supply chains.

1.21 Of the total operation resources, a projected 30.53% will be invested in climate change mitigation and adaptation activities, according to the joint methodology of the multilateral development banks for tracking climate change adaptation finance. These resources contribute to the IDB Group target of increasing financing for climate-related projects to 30% of approvals and operations by the end of 2020. (optional link 11)

B. Objectives, components, and cost

1.22 **Objective of the CCLIP.** The objective of the CCLIP is to improve agricultural productivity through investments that build the capacity of the Paraguayan government to provide quality public agricultural services to producers. The expected outcomes are a sustained increase in sector output and the consequent improvement in the quality of life of rural producers.

1.23 **First individual loan operation.** The objective of the first individual loan operation under the CCLIP is to help increase the productivity and environmental sustainability of the agriculture sector by strengthening the country's capacity to develop and transfer technology. To achieve these objectives, the project is structured into two components, described below.

1.24 **Component I. Organizational management and coordination with national and international agents (US$2.314 million).** The expected outcome of this component is improved institutional effectiveness of the IPTA as concerns production, management, and technology transfer. Access to national and regional knowledge will be enhanced, and additional resources mobilized, under

agreements with the private sector and research institutes in the region. To that end, the program will finance:

a. Strategic management improvements: Includes update of the operations manual, development of the Advisory Board operating regulations, creation of regional councils to identify productive sector demand and improve the dissemination of technologies, and support for formulation of the Institutional Strategic Plan.

b. Product management improvements: Technical support for the formulation of annual work plans and manuals on technical and administrative management processes, and the development and implementation of a management monitoring and evaluation manual.

c. Support capacity improvements: The purchase of crosscutting computer systems (integrated financial management system and project monitoring system), renewal of the IT equipment at head offices (Asunción and San Lorenzo), and purchase of software licenses.

d. Human resource management improvements: Includes the development and introduction of a human resources planning manual, development of a manual of job positions and descriptions, design of a career plan for researchers, development and implementation of a results-based performance evaluation manual, and a cofinancing fund for doctoral and master's scholarships in priority areas (see paragraph 3.5).

e. Commercialization of IPTA technology products, marketing, and intellectual property: Includes the technological linkage strategy, commercialization of technology products and intellectual property, marketing strategy, and development of a business plan that includes establishing the IPTA brand. Also includes the sharing of knowledge and good practices with research institutes of the region and with national and international experts.

1.25 **Component II. Improvement of innovation capacity (US$15.471 million).** This component seeks to improve the IPTA's innovation and technology transfer capacities, starting with the prioritization of lines of research established by the IPTA (see paragraph 1.8). The activities to be financed are organized into two main lines of action:

a. Eleven priority lines of innovation. Financing under this line of action will be for direct operating costs and the contracting of qualified national and international experts for defined periods of time, to strengthen priority programs. Additionally, for the forestry area, research proposals will be financed through a competitive fund[11] (optional link 7).

b. Infrastructure, equipment, and crosscutting services for the implementation of prioritized lines of research, including: (i) refurbishment of the four research centers; (ii) purchase of agricultural equipment and machinery; (iii) vehicles; and (iv) laboratories and lab equipment.

[11] The topics will emerge from a consulting engagement to develop the forestry research plan.

1.26 Lastly, financing will be provided for technology transfer through the development and implementation of a communication and dissemination strategy for the developed technologies.

1.27 **Other program costs (US$2.215 million).** Administration, monitoring, evaluation, and audit activities will be financed. The following program activities in particular will be supported: (i) administrative costs of the program; (ii) monitoring and evaluation, including the midterm and final evaluation, and impact evaluation; (iii) annual external audits of financial statements; and (iv) contingencies.

1.28 **Beneficiaries.** The strengthening of the IPTA, as a public entity responsible for agricultural technology development, will benefit Paraguay's entire agricultural sector. Also, in addition to the group of IPTA researchers to be trained, some 15,000 producers[12] in the research center area of influence will benefit directly from the technologies developed in priority research programs.

C. Key results indicators

1.29 The program's expected impacts are a contribution to increased productivity and environmental sustainability in the agricultural sector. The expected outcomes are to: (i) improve project planning, monitoring, and evaluation capacity; (ii) increase the number of researchers with specialized training (doctoral and master's degrees); (iii) improve the measurement of GHG emissions and carbon capture; (iv) increase the number of indexed publications produced by researchers; and (v) validate new farming technologies. The following impact indicators will be measured: (i) rate of adoption of transferred technologies (%); (ii) agricultural productivity (kg/ha); (iii) reduction in vulnerability to extreme events (%); (iv) GHG emissions, carbon capture, and water use efficiency (tCO_2e/ha and m^3/ha).

1.30 **Climate change.** The project includes climate change adaptation and mitigation actions (optional link 11), such as: (i) mainstreaming of climate change in all lines of research and transfer (development/adaptation of resilient genetic materials, practices to promote resilience and/or emissions reduction); (ii) design and construction or refurbishment of research centers in line with criteria of energy and water use efficiency, renewable energy, risk resilience, and waste and effluent management; and (iii) improvement of emission measurements by modeling carbon sequestration, nitrous oxide emissions, methane, and evapotranspiration.

1.31 **Digital agenda.** In addition to traditional investment in crosscutting computer systems to monitor financial and research project management with the respective equipment, work will be done in various lines of research with sensors and satellite images. For example, the line of research to quantify and simulate the stock of carbon and GHG emissions in crop farming and livestock systems involve the use of a Century-type carbon dynamics measurement model, which will have to be calibrated and validated based on satellite images and sensors.

1.32 **Economic evaluation of the first operation.** The ex ante cost-benefit analysis computes the relevant costs, including the loan investments, recurring additional costs for the operation and maintenance of updated and improved research

[12] The target population is 150,000 producers within the research center areas of influence, 20% of which will be reached through direct actions, and half of which will adopt the technologies over the course of the project.

centers, and the costs associated with strengthening their human capital. New technology adoption was estimated in four productive systems identified as the target (extensive farming, intensive farming, family farming, and cattle breeding). The quantified differential benefits were: (i) projected increases in crop and breeding yields net of incremental costs; (ii) reduction in vulnerability to recurring droughts; and (iii) decrease in the use of agrochemicals in the horticultural segment. The analysis results, using efficiency prices and a time horizon of 20 years, confirm that the program is viable in economic terms, with a net present value of US$12.8 million and an IRR of 16.8%.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

2.1 The multisector conditional credit line for investment projects (CCLIP) will total US$80 million, financed from the Bank's Ordinary Capital resources, and will be accessible for a term of 15 years. The CCLIP agreement will be signed between the Bank and the Republic of Paraguay. The first operation is designed as a specific investment loan with a total cost of US$20 million and does not include counterpart resources. Table 3 shows the costs by component; the breakdown under Component 2 is indicative.

Table 3. Estimated program costs (in U.S. dollars)*

Component	IDB	%
Component I. Organizational management and coordination with international and national agents	**2,314,000**	**11.6**
Component II. Improvement of innovation capacity	**15,471,000**	**77.4**
• **Innovation priority lines**	4,794,400	24.0
• **Infrastructure, equipment, and crosscutting services**	9,601,800	48.0
• **Technology transfer**	1,074,800	5.4
Program administration	**1,432,000**	**7.2**
Monitoring and evaluation	**360,000**	**1.8**
External financial audits	**150,000**	**0.7**
Contingencies	**273,000**	**1.4**
	20,000,000	**100.0**

* The projected costs include local taxes, in accordance with Bank policy.

2.2 The program disbursement period will be six years. Table 4 shows the disbursement schedule.

Table 4. Disbursement schedule (US$ millions)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
IDB	1.35	4.86	7.48	3.90	1.62	0.79	20.00
%	7	24	37	20	8	4	100

2.3 The CCLIP will be implemented through Multisector Modality II, in accordance with the criteria specified in the Proposed Amendments to the Conditional Credit Line for Investment Projects (CCLIP) and the Multiphase Program Loans (document GN-2246-13). The CCLIP amount is US$80 million, financed from the Bank's Ordinary Capital resources, and will be accessible for a term of 15 years. Up to four operations are expected to be carried out during that time. The liaison institution will be the Ministry of Agriculture and Livestock (MAG), acting through the Integrated Management System for Agricultural, Livestock, and Rural Development (SIGEST),[13] and the executing agencies will be the Paraguayan Institute for Agricultural Technology (IPTA) (first operation in the first sector) and the Plant and Seed Quality and Health Service (SENAVE) (first operation in the second sector). The National Cadastre Service (SNC) and the MAG itself may also be executing agencies.

2.4 **Rationale for the instrument.** The CCLIP is the most effective IDB operational instrument for financing both the first operation and subsequent investment operations to improve the country's agricultural productivity and competitiveness. The operations to be financed are expected to consist of investments of various sizes in sectors contributing to increased productivity with environmental sustainability. In that sense, the CCLIP is a strategic instrument, as it provides a frame of reference for resources in the medium and long term. The strategy of this CCLIP is to consolidate support services for Paraguay's agricultural sector as a package of efficient, effective, and broad-based services to improve agricultural sector competitiveness.

2.5 **Projects eligible for financing under the CCLIP.** Within the agricultural macrosector, individual operations under the CCLIP will finance projects in the sectors of agricultural innovation, plant/animal health and food safety, land administration, and rural assistance and extension (optional link 8). Specifically, a CCLIP using Multisector Modality II will make it possible to promote investments by institutions with a defined sector mandate,[14] under the common strategic vision of the MAG, which will act as liaison institution. The CCLIP is aligned with other initiatives being implemented by the Bank in the country.

2.6 **Fulfillment of CCLIP eligibility criteria.** The proposed CCLIP meets the applicable eligibility criteria (document GN-2246-13), as follows: (i) the areas to be financed are included in the Country Strategy with Paraguay 2019-2023 and in the corresponding country program with the Bank; and (ii) the liaison institution will be the MAG,[15] acting through SIGEST (or an entity superseding it with the same legal powers that is acceptable to the Bank), which has the appropriate legal mandate (Decrees 169/2008 and 6178/11). Moreover, the MAG developed the Agricultural Strategic Framework 2014-2018 and is leading the development of the new strategic framework. The MAG also has a long experience of executing loan operations, whether with the IDB or with the World Bank, IFAD, and other multilateral agencies; and (iii) the CCLIP has a well-defined multisector objective

[13] Decree 169/2008, Article 1: Interagency supervision, coordination, and evaluation body for the sector operational structure and its intersector complements. The IPTA is attached to the executive branch through the MAG (Law 3788/10, Article 3).

[14] The IPTA and SENAVE are the institutions that have requested financing thus far.

[15] Law 81/92, Article 3(h).

that is expected to be met with the credit line, based on a sound diagnostic assessment of multisector development challenges. No sequential operations or granting of investment guarantees is planned.[16] Subsequent individual loan operations will satisfy the applicable eligibility criteria established in document GN-2246-13.

2.7 **Fulfillment of eligibility criteria of the first individual operation under the CCLIP.** The first individual loan also meets the eligibility requirements of the aforementioned document, as follows: (i) the first loan operation falls under the sectors and components defined under the credit line; (ii) the operation contributes to the achievement of the multisector objective of improving agricultural productivity through investments that build the capacity of the Paraguayan government to provide quality public agricultural services; (iii) the Bank has performed a complete institutional capacity assessment of the IPTA, to evaluate its execution capacity, in line with the applicable Bank policies, including the procurement and financial management policies in effect and country laws and regulations; and (iv) based on the results of this assessment, actions to be taken in the identified areas of improvement were included (see paragraphs 2.9 and 3.3).

B. Environmental and social safeguard risks

2.8 The project is classified as Category "C." Additionally, since the refurbishment of some research center buildings and laboratories was pre-identified as necessary, an environmental and social analysis (ESA) was performed that focused on the current state of the four research centers to receive financing under the operation. The ESA found deficiencies in the handling of phytosanitary products (storage and final disposal of packaging or expired products), which constitute "environmental liabilities" not associated with program implementation, but ones that will have to be addressed during the program. The proposed environmental and social management plan (ESMP) sets out mitigation measures addressed through activities under Component II[17] (optional link 6).

C. Fiduciary risks

2.9 During the preparation of the operation, the IPTA's institutional capacity was assessed in relation to programming and organizational capacity; execution capacity for the programmed and organized activities, which includes systems for financial, goods and services, and personnel administration; and control capacity. According to the assessment, the IPTA generally possesses technical expertise in the fiduciary area. The consolidated result of the IPTA capacities assessed using the Institutional Capacity Assessment System (ICAS) reveals a medium degree of development and risk. The following main actions are planned, to mitigate the medium risk: (i) training on the Bank's financial management policies in the accounting and internal control areas; (ii) training on the Bank's procurement policies; and (iii) development of job descriptions for the executing agency's fiduciary positions.

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16 This possibility is raised in document GN-2246-13.

17 The works include improvements to the existing physical plant of the four research centers, as well as food services and laboratories to support researchers (optional link 6).

D. Other key risks and issues

2.10 The following medium risks were identified that could affect project execution: (i) delays in project approval by the legislative branch; (ii) noncompliance with the procurement plan; and (iii) loss of technical staff receiving scholarships to better job opportunities. The respective mitigation measures are as follows: (i) provide the information necessary for the Congress proceedings; (ii) hire procurement specialists with knowledge of IDB policies; and (iii) enter into agreements with scholarship recipients and develop a career plan for researchers. High-level risks were also identified, as follows: (i) execution delays due to changes of authorities in the next government changeover; and (ii) delays in the start and delivery of research center works. The following mitigation measures were identified for these risks: (i) present the project to the new authorities; and (ii) process environmental permits, regularize property titles or loan-for-use agreements, and review designs. A mitigation matrix was developed for both types of risk, with the associated costs.

2.11 **Sustainability.** A set of actions was incorporated to guarantee long-term sustainability. The project will therefore seek to: (i) increase private-sector participation by setting rules for the work of the Advisory Board and establishing regional councils to enhance the relevance of the technology transfer and research actions; (ii) develop a marketing and commercialization strategy for the products generated, in order to increase extrabudgetary income; (iii) enter into agreements with the private sector through private institutions, in order to encourage collaboration and secure additional financing (see paragraph 1.15(e)); (iv) partner with regional peers to draw on regional knowledge; (v) create a career plan for researchers, in order to improve their pay, and so prevent talent drain; and (vi) strengthen technology transfer through the promotion of networking and coordination with organizations, in order to guarantee the sustainable adoption of new technologies by the productive sector.

III. Implementation and Management Plan

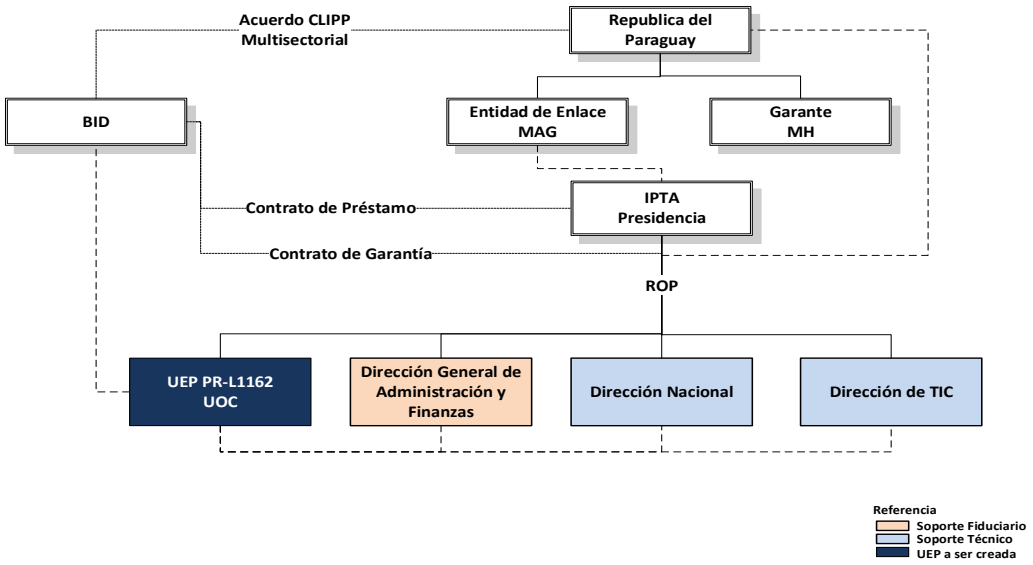
A. Summary of implementation arrangements

3.1 **Borrower and executing agency.** The borrower and executing agency will be the Paraguayan Institute for Agricultural Technology (IPTA), with the guarantee of the Republic of Paraguay. Under the country's financial administration legislation, the Republic of Paraguay can only guarantee the monetary obligations of these borrowers, associated with service of the loan (repayment of principal and payment of interest and fees). For this reason, an exception to the policy on Guarantees Required from the Borrower (document GP-104-2) is sought, whereby the sovereign guarantee of the Republic of Paraguay will apply solely to the monetary obligations of the loan to be entered into between the Bank and the IPTA, including the repayment of principal and payment of interest and fees.[18]

[18] Under Law 3788/10, the IPTA is authorized to finance its budget with resources from, among other sources, domestic or external loans, ordinary and extraordinary allocations under the country's general budget and special laws; and income from the sale of goods and services provided by the institution. The IPTA has sufficient capacity to meet its obligations assumed with the Bank, so the exemption will not affect the project's operational risk profile. The financial information provided by the IPTA to the Ministry of Finance projects sufficient future income to repay the loan.

3.2 A program execution unit (PEU) will be established within the executing agency to perform the following actions: general coordination for execution of the components; programming and monitoring; administration and finance; and procurement and contracting. The PEU will report to the Office of the President of the IPTA and will have operational procurement unit status. It will also receive fiduciary support from the Directorate-General of Administration and Finance, as well as technical support from the National Directorate and the institution's Directorate of Information and Communication Technology. The organizational chart is shown below.

Figure 2. Program organizational chart



Source: Prepared by the IDB.

3.3 **PEU structure.** The PEU will have a program team comprising at least the following key staff: (i) program manager; (ii) finance and administration specialist; and (iii) procurement specialist. **As a special contractual condition precedent to the first disbursement of the loan: the program execution unit (PEU) has been created, and key staff have been assigned or hired for the PEU project team, based on the terms of reference previously agreed upon with the Bank.** This condition is necessary to ensure that the executing agency has the minimum capacity necessary to begin project execution. Consistent with the institutional capacity assessment, the program team will also include the following positions: (i) Component I manager; (ii) Component II manager; (iii) planning and monitoring specialist; (iv) fiduciary support officer; and (v) environmental and climate change specialist.

3.4 **Program Operating Regulations.** The program will be governed by Operating Regulations that describe, among other things: (i) the responsibilities and functions of each program actor and the mechanisms for coordination among them; (ii) the rules and procedures for activity programming and execution, administrative and financial management, procurement and contracting processes, audits, and

monitoring and evaluation; (iii) the rules for nominating scholarship candidates; (iv) mechanisms for modifying and/or introducing new lines of research; (v) technology transfer strategies and their linkage with climate change mitigation and adaptation actions; and (vi) the modalities for implementing environmental and social safeguards (ESMP). **As a special contractual condition precedent to the first disbursement of the loan, the program Operating Regulations have been approved on terms previously agreed upon with the Bank.** This requirement is justified by the need for the executing agency to have clear procedures for implementing the program and meeting its contractual obligations.

3.5 The IPTA will establish an interagency agreement with the BECAL program or other appropriate entity acceptable to the Bank, to encourage the training of IPTA technical staff through doctoral and master's degree scholarships. The agreement will define the execution modality and the cofinancing percentage to be covered by the program.

3.6 **Fiduciary management.** The fiduciary agreements and requirements for program execution are reflected in Annex III.

3.7 **Procurement.** Procurements will be identified in the procurement plan approved by the Bank and will be conducted under the Policies for the Procurement of Goods and Works Financed by the IDB (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9), as subsequently updated. The Bank will supervise procurements of goods and the contracting of works and services with program resources in accordance with Annex III and the procurement plan.

3.8 **Financial management.** Program financial management and supervision will be conducted in accordance with the Financial Management Guidelines for IDB-financed Projects (document OP-273-6). The loan proceeds may be disbursed under the modalities of advance of funds, reimbursement of expenditures, and direct payments to vendors. The advance of funds modality will be based on expenditure projections for up to 180 days, with an 80% minimum percentage for the replenishment of advances.

3.9 **Audits.** Standard requirements and terms will apply, as established in Bank policies. External audit services will be provided by an eligible private audit firm, in accordance with Bank policies.

B. Summary of arrangements for monitoring results

3.10 The program has a monitoring and evaluation plan that specifies: (i) the methodology for measuring indicators; (ii) the methodology for evaluating the impact of various components; (iii) data requirements (baseline and follow-up survey); and (iv) responsible parties and estimated budget for the implementation of activities. The impact assessment will be financed with loan proceeds in the amount of US$360,000.

3.11 **Monitoring.** The IPTA will deliver a progress monitoring report to the Bank, no later than 60 days after the end of each six-month period of each year during execution, for the corresponding activities. The reports will focus on the fulfillment of output indicators, progress on outcomes, and execution of the project ESMP. The reports to be submitted in the second half of the year will include the annual

work plan for the following calendar year, with a disbursement forecast and an updated procurement plan.

3.12 **Evaluation.** The IPTA will deliver a midterm evaluation report to the Bank within 90 days after the date on which 50% of the loan proceeds have been committed, or 50% of the execution period has elapsed, whichever occurs first. It will deliver a program completion report within 90 days after the date on which 90% of the loan proceeds have been disbursed. The final evaluation report will include the results of the program impact assessment and will employ two methodologies: (i) random cohorts, to measure the impact of the IPTA transfer activities; and (ii) difference-in-difference matching, to measure the impact of overall IPTA capacity building.

Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	Yes	
Development Challenges & Cross-cutting Themes	-Productivity and Innovation -Climate Change and Environmental Sustainability -Institutional Capacity and the Rule of Law	
Country Development Results Indicators	-Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)* -Farmers with improved access to agricultural services and investments (#)* -Beneficiaries of IDBG projects that contribute to at least one key dimension of food security (#)*	
2. Country Development Objectives	Yes	
Country Strategy Results Matrix	GN-2958	Contributing to the strategic objectives of strengthening public management capacities and fostering the international insertion of companies.
Country Program Results Matrix	GN-2948-2	The intervention is included in the 2019 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		Parrafo 1.21
II. Development Outcomes - Evaluability		Evaluable
3. Evidence-based Assessment & Solution	6.3	
3.1 Program Diagnosis	2.0	
3.2 Proposed Interventions or Solutions	2.3	
3.3 Results Matrix Quality	2.1	
4. Ex ante Economic Analysis	7.0	
4.1 Program has an ERR/NPV, or key outcomes identified for CEA	3.0	
4.2 Identified and Quantified Benefits and Costs	0.0	
4.3 Reasonable Assumptions	1.0	
4.4 Sensitivity Analysis	2.0	
4.5 Consistency with results matrix	1.0	
5. Monitoring and Evaluation	9.3	
5.1 Monitoring Mechanisms	2.5	
5.2 Evaluation Plan	6.8	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	Medium	
Identified risks have been rated for magnitude and likelihood	Yes	
Mitigation measures have been identified for major risks	Yes	
Mitigation measures have indicators for tracking their implementation	Yes	
Environmental & social risk classification	C	
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, Accounting and Reporting. Procurement: Information System, Price Comparison.
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	Through the Technical Cooperation PR-T1267, support was provided to IPTA and technical inputs were prepared for the formulation of the PR-L1162 Project

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

This is the first operation under the CCLIP whose objective is to improve agricultural productivity through investments that improve the capacity of the Paraguayan State to provide quality agricultural public services to producers. The objective of this first operation is to contribute to the increase in productivity and environmental sustainability of the agricultural sector, through the strengthening of the country's capacity to generate and transfer technologies. The diagnosis identifies and provides evidence on productivity gaps and highlights the need to improve agricultural public services, particularly the generation and transfer of technologies. However, it is less precise in providing evidence on demand factors that inhibit technology adoption by producers. The link between the diagnosis and the proposed interventions is not entirely solid, since it is limited by the lack of an effective demand assessment on the producers' side.

The vertical logic of the results matrix could be strengthened including outcome indicators that capture advances in the diffusion of technologies. Not all outcome indicators are SMART.

The economic analysis is based on estimating the differential benefits: (i) projected increases in crop yields and animal rearing, net of incremental costs; (ii) reduction of vulnerability to recurrent droughts; and (iii) decrease in the costs of using agrochemicals in the horticultural segment. Not all assumptions used are well justified or supported by evidence.

The monitoring and evaluation plan meets the requirements. The use of quasi-experimental methods to attribute the results to program interventions is proposed. However, given the low estimated statistical power, it is unlikely that the proposed evaluation will detect impacts.

RESULTS MATRIX

Objective of the CCLIP:	To improve agricultural productivity through investments that build the capacity of the Paraguayan government to provide quality public agricultural services to producers.
Specific objective of the program:	To help increase the productivity and environmental sustainability of the agriculture sector by strengthening the country's capacity to develop and transfer technology.

EXPECTED IMPACTS

Indicators	Unit of measure	Baseline	Base year	Targets		Means of verification	Comments
				Value	Year		
Impact 1. Increased rate of adoption of technologies transferred by the IPTA Extensive farming • Rice • Soybean Family farming • Sugar cane • Cassava Horticulture • Tomato Livestock • Cattle breeding systems	%	 0 2 2 2 2 0	2018	 8 8 5 5 5 5	2027	Impact assessment and IPTA reports	Baseline: IPTA reports
Impact 2. Increased yield per hectare (multiyear average) Extensive farming • Rice • Soybean • Wheat Family farming • Sugar cane • Cassava Horticulture • Tomato	kg/ha	 5,731 2,573 2,179 52,516 16,245 38,396	Average 2009-2018	 7,626 3,489 2,227 68,233 20,704 54,410	Average 2026-2035	MAG annual statistical summary	Expected impact 2026-2035 in the research center area of influence. *Rice*: Caazapá, Itapúa, and Misiones departments. *Soybean*: Alto Paraná, Caaguazú, Canindeyú, and Itapúa departments. *Wheat:* Alto Paraná, Caazapá, Caaguazú, and Itapúa departments. *Sugar cane:* Caaguazú, Guaira, and Paraguarí departments. *Cassava*: Caaguazú, Canindeyú, Concepción, and San Pedro departments. *Tomato*: Caaguazú, Central, Paraguari departments.

Indicators	Unit of measure	Baseline	Base year	Targets		Means of verification	Comments
				Value	Year		
Impact 3. Reduced vulnerability to extreme events. Decrease in losses caused in years of drought among producers that adopt new technologies • Soybean • Wheat • Sugar cane • Cassava	%	46.3% 32.8% 31.2% 39.6%	Average losses due to drought between 2009 and 2018	34.7% 24.6% 23.4% 29.7%	Average losses due to drought between 2026 and 2035	MAG annual reports – Statistical summary	Baseline corresponds to periods of drought during 2009-2018. The loss percentage results from a comparison with average production over the previous three years (indicators subject to occurrence of drought – likelihood of recurrence 1:6 years for soybean, 1:10 years for wheat, sugar cane, and cassava). Includes emergencies declared by municipal and departmental governments based on indicators established by the Meteorology and Hydrology Directorate of the National Civil Aviation Directorate.
Impact 4. Increased environmental efficiency of agricultural production through the reduction of GHG emissions, carbon capture, and water use efficiency.	tCO_2e/ha per year tCO_2e/ha per year m^3/ha per year	(1)	2019	(2)	2027	Consulting reports	(1) Baseline: Experimental parameters and satellite data will be used to model carbon sequestration, greenhouse gas emissions, and evapotranspiration. To be completed in the Capitán Miranda Research Center area of influence. Consultation on the execution of the study is one of the program activities. (2) Target: Expected change to be determined further to baseline study.

EXPECTED OUTCOMES

Expected outcomes	Unit of measure	Baseline		Targets							Means of verification	Comments
		Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total		
Outcome 1. Project planning, monitoring, and evaluation capacity increased	Annual report	0	2019	0	0	1	1	1	1	4	IPTA report	Will include an analysis by project (lines of research) of the physical and financial progress of each project. Requires planning capacity, information generation, an operational computer system, and qualified staff.
Outcome 2. Number of researchers with specialized professional training (doctoral/master's degrees) increased	Doctoral/ master's degrees	36	2019	34	32	30	28	38	50	50	IPTA report	Target: Determined based on predicted employee departures and the incorporation of 50% of the 49 scholarship holders under the program. The assumption is that the IPTA will improve the institution's wage competitiveness.
Outcome 3. Measurements of greenhouse gas emissions and carbon capture taken by the IPTA[1]	Measurements	0	2019	0	0	0	1	1	1	3	IPTA report	This refers to the capacity to measure emissions from crop farming and livestock raising systems located in their areas of intervention so that the measurements can then be used as a scientific basis to update the sector's emission reduction targets, to be reported in Paraguay's NDC and its annual follow-up.

[1] Unplanned impact: These measurements will enable the assessment of emission reduction strategies across broader areas.

Expected outcomes	Unit of measure	Baseline		Targets							Means of verification	Comments
		Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total		
Outcome 4. Indexed publications produced by IPTA researchers	Publications	5	2018	5	5	10	15	15	20	75	Publications	An indexed publication or journal is a periodic high-quality research publication listed in any database, index, or directory available for worldwide consultation.
Outcome 5. New agricultural technologies that support climate change adaptation and/or emission reduction validated	Technologies	0	2019	0	3	3	3	3	3	15	IPTA technical reports validated by external users	**Technology:** New materials, such as varieties, hybrids, clones, and prototypes, or technological components, such as fertilization, sowing method, methods, processes, and diagnostic model. **Technology validated:** Approved by a committee of external technical users.

OUTPUTS

Outputs	Unit of measure	Baseline		Targets							Means of verification	Comments
		Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total		
Component 1: Organizational management and coordination with international and national agents												
Output 1. Strategic management documents developed and approved	Documents	0	2020	5	0	0	0	0	0	5	Documents approved by IPTA resolutions	Documents include operational manual, institution's organizational chart, operating regulations of the Advisory Board, and strategic planning manual.
Output 2. Product management documents developed and introduced	Documents	0	2020	3	0	0	0	0	0	3	Documents approved by IPTA resolutions	Documents include initial year AWP prepared by management, management process protocol, and monitoring and evaluation plan.
Output 3. IT management systems developed and operational	System	0	2020	0	2	0	0	0	0	2	Technical performance report	Includes development, equipment, and technical support for the implementation and operation of the Integrated Project Management System and the Integrated Financial Management System.
Output 4. Human resource management documents developed	Documents	0	2020	4	4	0	0	0	1	9	Annual management plans	Includes planning, monitoring, and implementation manual, manual on job positions and profiles, performance evaluation, salary scale, study of wages, employee survey, and improvement plan.
Output 5. Support for the strategy on (IPTA brand) technological product commercialization, marketing, and intellectual property developed and executed	Reports	0	2020	1	1	1	1	1	1	6	Annual management plans	Approval of strategy in year 1 and annual follow-up reports.

Outputs	Unit of measure	Baseline		Targets							Means of verification	Comments
		Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total		
Component 2: Improvement of innovation capacity												
Output 6. New soybean and/or wheat varieties developed	Varieties	0	2020	0	1	0	1	0	1	3	Technical report validated, Component 2 manager	Baseline: Nil because these are new varieties developed by the program. Varieties are considered developed when the SENAVE registration process is initiated.
Output 7. Soybean and wheat management technologies developed	Technology	0	2020	0	0	0	0	0	2	2	Technical report validated, Component 2 manager	The adjustment in management practices will be reflected in at least two technical publications.
Output 8. New rice varieties developed	Varieties	0	2020	0	1	0	1	0	0	2	Technical report validated, Component 2 manager	Baseline: Nil because these are new varieties developed by the program. Varieties are considered developed when the SENAVE registration process is initiated.
Output 9. Irrigation and soil management technologies for rice adjusted	Technology	0	2020	0	0	0	0	0	1	1	Technical report validated, Component 2 manager	The adjustment in management practices will be reflected in at least two technical publications.
Output 10. Family farming vegetable and cash crops varieties adapted	Varieties	0	2020	0	1	1	1	1	1	5	Technical report validated, Component 2 manager	Baseline: Nil because these are new varieties adapted by the program. Varieties are considered developed when the SENAVE registration process is initiated.
Output 11. Family farming vegetable and cash crop management technologies adjusted	Technology	0	2020	0	0	1	0	0	1	2	Technical report validated, Component 2 manager	The adjustment in management practices will be reflected in at least two technical publications.
Output 12. Quantification and simulation of carbon and emissions stocks in crop farming and livestock raising systems completed	Documents	0	2020	0	0	0	0	1	1	2	Technical publication reviewed	Includes (a) experiments to quantify the stock of carbon and nitrous oxide emissions into various sequences and (b) consulting services to develop the methodology for estimating carbon flows in agricultural and livestock areas.

Outputs	Unit of measure	Baseline		Targets							Means of verification	Comments
		Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total		
Output 13. Weed, disease, and pest management technologies in extensive and intensive agricultural crops developed	Technologies	0	2020	0	0	1	0	0	1	2	Technical report validated, Component 2 manager	Includes a technical report on extensive crops and another on intensive crops.
Output 14. Technologies for cattle breeding production systems of varying intensity developed	Technologies	0	2020	0	0	0	0	0	1	1	Technical report validated, Component 2 manager	Includes a diagnostic assessment, the definition of lines of research, and early research accomplishments.
Output 15. Diagnostic assessment and quantification of the impact of reproductive and parasitic animal diseases completed	Document	0	2020	0	0	0	0	0	1	1	Technical report validated, Component 2 manager	Includes a diagnostic assessment, the definition of lines of research, and early research accomplishments.
Output 16. Studies identifying forestry research topics conducted	Document	0	2020	0	0	0	0	1	1	2	Publication peer reviewed	Includes a consultation that analyzes and outlines, jointly with INFONA and the Forestry Sciences Department of the National University of Asunción, a call for competitive funding on duly selected and agreed topics.
Output 17. Research center agricultural infrastructure, equipment, and machinery installed and operational	Research centers	0	2020	0	0	2	2	0	0	4	IPTA acceptance reports Equipment and machinery acquisition reports	Includes designs, procurement of works, and oversight, in addition to the acquisition and commissioning of the equipment and machinery of the Capitán Miranda, Caacupé, Chore, and Barrerito research centers. The research centers to be renovated will include measures and equipment that reduce water and electricity consumption and that save energy in construction materials.
Output 18. Communication and dissemination strategy for available technologies developed	Reports	0	2020	1	1	1	1	1	1	6	Annual management plans	Reports include details on the activities carried out, such as technical and audiovisual seminars, brochures, technical publications, demos of technologies developed in research centers, and regular web portal updates.

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Paraguay
Project number:	PR-L1162
Project name:	Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Agricultural Public Services and Improved Productivity (PR-O0003) and First Individual Program to Finance the Improvement of Agricultural Research, Innovation, and Technology Transfer in Paraguay
Executing agency:	Paraguayan Institute for Agricultural Technology (IPTA)
Prepared by:	Fernando Glasman, Jorge Seigneur, and Jorge Luis González (Fiduciary Specialists)

I. EXECUTIVE SUMMARY

1.1 The institutional assessment for fiduciary management was conducted between the Bank's fiduciary team and staff of the administrative/financial and procurement units of the Paraguayan Institute for Agricultural Technology (IPTA). It was supplemented with the August 2019 findings of the Institutional Capacity Assessment System (ICAS) analysis of the IPTA and the program risk matrix. The fiduciary agreements have been developed as a result of these actions.

1.2 The program is part of the Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Agricultural Public Services and Improved Productivity (PR-O0003).

II. FIDUCIARY CONTEXT OF THE COUNTRY

2.1 In general terms, the country financial management systems have a medium level of development. For the purpose of executing Bank-financed projects, these systems must be supplemented in relation to specific financial reports and external control by auxiliary accounting systems and the engagement of Bank-eligible private audit firms. Financial control tools such as the Integrated Financial Administration System (SIAF), Accounting System (SICO), and other subsystems enable executing agencies to make payment transfers to vendors of goods and services through the central bank. Their integration will allow program or project audited financial statements to be produced using the SIAF at some point in the future. Meanwhile, parallel systems will be used.

2.2 The country's Public Sector Procurement System (SCSP) has made efficiency and transparency gains in recent years following the creation of its apex agency, the National Public Procurement Directorate (DNCP), enabling the implementation of a transactional purchasing platform with electronic procedures, such as electronic

reverse auction, a vendor system, and the Statistical Information System. The Public Procurement Information System (SICP) is used for Bank-financed operations, as are the country electronic reverse auction and competitive bidding subsystems for the amounts and categories established in the agreement for their use, signed on 17 June 2014.

III. Fiduciary Context of the Executing Agency

3.1 The program executing agency will be the Paraguayan Institute for Agricultural Technology (IPTA), acting through the program execution unit (PEU), reporting to the Office of the President with the status of operational procurement unit. The PEU will have fiduciary support from the Directorate General of Administration and Finance (DGAF) and technical support from the National Directorate and the Information and Communication Technology Directorate. More details on the execution mechanism will be provided in the program Operating Regulations.

3.2 During the preparation of the operation, the IPTA's institutional capacity was assessed in relation to programming and organizational capacity; execution capacity for the programmed and organized activities, which includes systems for financial, goods and services, and personnel administration; and control capacity. According to the assessment, the IPTA possesses technical expertise in the fiduciary area. The consolidated result of the IPTA capacities assessed using the Institutional Capacity Assessment System (ICAS) reveals a medium degree of development and risk.

3.3 The PEU will be responsible for operational management, procurement monitoring, and financial administration and will be the IDB's counterpart and the program's representative to other agencies.

IV. Fiduciary Risk Evaluation

4.1 Based on the evaluations, the opportunities for improvement must focus on:

a. Implementation of the program Operating Regulations;

b. Training on the Bank's financial management policies in the accounting and internal control areas;

c. Training on the Bank's procurement policies;

d. Development of job descriptions for fiduciary positions (financial management specialist and procurement specialist) and recruitment for those positions.

V. Considerations for the Special Provisions of the Contract

5.1 Below are the agreements and requirements to be considered for the special provisions:

a. For the purposes of Article 4.10 of the General Conditions, the parties agree that the exchange rate to be used will be the rate stipulated in Article 4.10(b)(i). The agreed exchange rate will be the exchange rate in effect on the date of conversion of the currency of approval or disbursement into the local currency

of the borrower's country. For the purpose of determining the equivalency of expenditures incurred in local currency chargeable against the local contribution, the agreed exchange rate will be the rate in effect at the time of payment whereby the IPTA, or any other person or corporation with delegated authority to incur expenditures, makes the respective payments to the contractor, vendor, or beneficiary. For the purpose of determining the equivalency of reimbursement of expenditures against the loan proceeds, the agreed exchange rate will be the rate in effect on the date of the reimbursement request.

b. The program annual financial statements will be delivered no later than 120 days after the end of the fiscal year, and final financial statements no later than 120 days after the date of the last disbursement.

VI. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

6.1 The procurement policies applicable to this loan are documents GN-2349-9 and GN-2350-9, as subsequently updated. The Bank's Board of Executive Directors has also approved the use of the electronic reverse auction and competitive bidding subsystems and Paraguay's Public Sector Procurement System (SCSP), (Law 2051/03) (document GN-2538-11). The use of other country systems approved following project approval will apply automatically and will be indicated in the procurement plan.

a. **Procurement execution.** The IPTA will be responsible for selection, procurement, contracting, supervision, and acceptance of program procurements.

b. **Procurement of works, goods, and nonconsulting services.** Contracts for works, goods, and nonconsulting services[1] contracts subject to international competitive bidding (ICB) will be executed using the standard bidding documents issued by the Bank. Bidding processes subject to national competitive bidding (NCB) will be executed using national bidding documents agreed upon with the Bank. The project sector specialist will be responsible for reviewing the technical specifications of procurements during the preparation of selection processes.

c. **Selection and contracting of consultants.** Contracts for consulting services generated under the project will be executed using the standard request for proposals issued by or agreed upon with the Bank. The project sector specialist will be responsible for reviewing the terms of reference for the contracting of consulting services. No direct contracting of individual consultants is planned.

d. **Use of country system.** In accordance with document GN-2538 of October 2013, the use of the electronic reverse auction and competitive bidding subsystems of Paraguay's Public Sector Procurement System (SCSP) in Bank-financed operations will be applicable: (i) to all contracts for goods and nonconsulting services subject to the use of the electronic reverse auction procedure under the SCSP and involving amounts below the Bank's

[1] Policies for the Procurement of Goods and Works financed by the Inter-American Development Bank (document GN-2349-9), paragraph 1.1: nonconsulting services are treated as goods.

established threshold for the shopping method for off-the-shelf goods (for reference, US$250,000); (ii) to all contracts for works involving amounts below the Bank's established threshold for use of the competitive bidding (shopping) method for complex works (for reference, US$250,000), and for contracts for goods and nonconsulting services up to the amount established by the Bank for use of the shopping method for complex goods and services (for reference, US$50,000); and (iii) contracts for amounts equal to or greater than the aforementioned amounts will be governed by Bank policies (document GN-2349-9). Section 1 of the Bank's policies (document GN-2349-9) will apply to all executed contracts, regardless of amount or procurement method. Any subsequently approved system or subsystem will apply to the operation. The operation procurement plan and its updates will indicate which procurements processes are to be executed using the approved country systems. If the Bank validates another system or subsystem, that system or subsystem will be applicable to the operation, as established the Loan Contract.

e. **Recurrent expenditures.** To establish the necessary conditions for the program execution unit (PEU) to perform its functions, the loan proceeds will be used to finance utility and communication costs, bank fees, and costs associated with notices, photocopies, mail, etc. in connection with the project within the annual budget approved by the Bank. These will be in accordance with the procedures of the executing agency, provided that such procedures do not violate the core principles of competition, efficiency, and economy. However, operating costs do not include the wages or salaries of government employees.[2]

6.2 **Domestic preference.** None anticipated.

Table 1. Threshold amounts for international competitive bidding and international short list*

Method	ICB Works	ICB Goods and nonconsulting services	International short list for consulting services
Threshold	3,000,000	250,000	200,000

* The threshold amounts may change, in which case the new thresholds will apply, and the procurement plan will be adjusted accordingly.

Table 2. Procurements by contracting segment[3]

Totals by process	Amount in US$
Works total	3,047,030
Goods total	8,485,125
Nonconsulting services total	879,000
Consulting firms total	1,290,045
Individual consulting services total	5,210,800
Training total	-
Procurement plan total	**18,912,000**

[2] As an exception, incremental personnel costs incurred by the executing agency specifically in connection with project execution will be financed (document GN-2331-5, Annex I, 1.7. C.c.1.22).

[3] The procurement plan contains an itemized list of procurement processes.

6.3 **Procurement supervision.** All procurement and/or contracting processes governed by procurement policy documents GN-2349-9 and GN-2350-9 will be subject to ex ante review by the Bank, taking into account the government's position in such regard. The country system will be used for supervision of all procurement processes governed by the electronic reverse auction and competitive bidding subsystems of Paraguay's Public Sector Procurement System (SCSP) (document GN-2538-11). Supervision may be supplemented by project audits.

6.4 **Special provisions.** No special provisions are envisaged additional to those specified in paragraph 5.1(b) of this Annex. Efforts will be made to apply green procurement criteria and practices provided in the guidelines to all program procurements.[4]

6.5 **Records and files.** Approved formats or procedures as described in the project Fiduciary Functions and Procedures Manual will be used in preparing and filing project reports.

VII. Financial Management Agreements and Requirements

7.1 **Programming and budget.** The IPTA will centralize execution through the PEU, which will have logistical support from the other units providing legal counsel on rules and procedures, IT services, human resource management, and logistical support.

7.2 **Accounting.** Accounting will be on an accrual basis. However, cash basis will be for accountability reporting on projects financed in part or in full by the IDB. The SIAF is the main budget and accounting transaction manager, connected to the SICO as the accounting subsystem. Together with other subsystems, they are used to download information and produce reports accessible to the Bank and other sources of financing.

7.3 **Information systems.** The PEU will have access to the SIAF. The country systems do not issue the reports necessary for the Bank, which are prepared using different systems. This involves the development and implementation of an independent, integrated system with a financial, management, and monitoring module in line with the program requirements.

7.4 **Disbursements and cash flow.** Disbursements will be made through advances of funds, which will be corroborated by a detailed financial plan submitted monthly for six months, showing the actual program demand arising from the multiyear execution plan, annual work plan, and procurement plan. For the second and subsequent disbursements, 80% of the advance allocated must be accounted for during program execution, pursuant to Operational Policy OP-273-6 on financial management and its updates.

7.5 **Internal control and internal audit.** To address the observations made in the ICAS assessment of the internal control system, it is agreed: (i) that procedures for employees to report the existence or absence of conflicts of interest be validated and that they be made aware of the risk analysis methodology; and

[4] See https://publications.iadb.org/en/green-procurement-how-encourage-green-procurement-practices-idb-funded-projects.

(ii) that progress in implementing the system referred to in point 2 be reported periodically to the Bank.

7.6 **External control and reports.** The executing agency, acting through the PEU, will deliver annual audit reports for the program on activities financed through the Bank loan. These reports will be prepared by an accepted independent audit firm, in accordance with the terms of reference previously approved by the Bank. Such external audit reports will be subject to publication under the Access to Information Policy.

7.7 **Financial supervision plan.** Financial supervision may be adjusted according to project execution and audit reports. It will be carried out by three means:

Table 1. Financial supervision plan

Nature/Scope	Frequency
Financial audit and submission of audited financial statements	Annual
Review of disbursement requests and attached reports	Two or three per year
Inspection visit / analysis of internal controls and control environment in executing agency	Annual

7.8 **Execution mechanism** The IPTA will be the borrower and executing agency. A PEU will be established within the executing agency that will carry out the following actions: overall coordination for component execution; programming and monitoring; administration and finance; and procurement. The PEU will report to the Office of the President of the IPTA, with fiduciary support from the DGAF.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/19

Paraguay. Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Public Agricultural Services and Productivity Improvement (PR-O0003)

The Board of Executive Directors

RESOLVES:

1. To authorize the President of the Bank, or such representative as he shall designate, to enter into such agreement or agreements as may be necessary with the Republic of Paraguay to establish the Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Public Agricultural Services and Productivity Improvement (PR-O0003) for an amount of up to US$80,000,000 chargeable to the resources of the Bank's Ordinary Capital.

2. To determine that the resources allocated to the above-mentioned Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Public Agricultural Services and Productivity Improvement (PR-O0003), shall be used to finance individual loan operations in accordance with: (a) the objectives and regulations of the Conditional Credit Line for Investment Projects approved by Resolution DE-58/03, as amended by Resolutions DE-10/07, DE-164/07, DE-86/16 and DE-98/19; (b) the provisions set forth in documents GN-2564-3 and GN-2246-13; and (c) the terms and conditions included in the Loan Proposal for the corresponding individual operation.

(Adopted on __ _____ 2019)

LEG/SGO/CSC/EZSHARE-746870777-12154
PR-O0003

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/19

Paraguay. Loan ____/OC-PR to the Instituto Paraguayo de Tecnología Agraria (IPTA). Conditional Credit Line for Investment Projects (CCLIP) (PR-O0003). First Individual Program to Finance the Improvement of Research, Innovation, and Transfer of Agricultural Technology in Paraguay (PR-L1162)

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 Instituto Paraguayo de Tecnología Agraria (IPTA), as borrower, and with the Republic of Paraguay, as guarantor, for the purpose of granting the former a financing aimed at cooperating in the execution of the First Individual Program to Finance the Improvement of Research, Innovation, and Transfer of Agricultural Technology in Paraguay, which constitutes the first individual operation under the Conditional Credit Line for Investment Projects (CCLIP) to Finance Support for Public Agricultural Services and Productivity Improvement, approved on _____ 2019 by Resolution DE-___/19. Such financing will be in the amount of up to US$20,000,000, from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on __ _____ 2019)

LEG/SGO/CSC/EZSHARE-746870777-12153
PR-L1162