Document of
The World Bank

Report No: ICR00003922

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-96758)

ON A

GRANT

IN THE AMOUNT OF US$4.5 MILLION

TO THE

ITAIPU BINACIONAL

FOR A

CONSERVATION OF BIODIVERSITY AND SUSTAINABLE LAND MANAGEMENT IN THE ATLANTIC FOREST OF EASTERN PARAGUAY

January 10, 2017

Environment and Natural Resources Global Practice
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 29, 2016)

Currency Unit = Paraguayan Guarani (PYG)
PYG 1.00 = US$ 0.00017
US$ 1.00 = PYG 5,820

FISCAL YEAR

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
ESMF	Environmental and Social Management Framework
GCF	Green Climate Fund
GoP	Government of Paraguay
ha	hectare
IB	ITAIPU Binacional
IICA	Inter-American Institute for Agricultural Cooperation
INDI	National Indigenous Peoples Institute (*Instituto Nacional del Indígena*)
IP	Indigenous Peoples
IPPF	Indigenous Peoples Planning Framework
IRR	Internal Rate of Return
MAG	Ministry of Agriculture and Livestock *(Ministerio de Agricultura y Ganadería*)
MTR	Midterm Review
NPV	Net Present Value
NRM	Natural Resource Management
OP	Operational Policy
PA	Protected Area
PARN	Natural Resources Management Project
PIU	Project Implementation Unit
PRODERS	Sustainable Agriculture and Rural Development Project (*Proyecto Desarrollo Rural Sostenible*)
SEAM	Secretariat of Environment (*Secretaría del Ambiente*)
SINASIP	National Protected Areas System (*Sistema Nacional de Areas Protegidas*)
UPAF	Upper Paraná Atlantic Forest

Senior Global Practice Director: Julia Bucknall (Acting)

Practice Manager: Raul Ivan Alfaro-Pelico

Project Team Leaders: Ruth Tiffer-Sotomayor, Pablo Herrera

ICR Team Leader: Ruth Tiffer-Sotomayor

ICR Author: Francis V. Fragano

PARAGUAY

Conservation of Biodiversity and Sustainable Land Management
in the Atlantic Forest of Eastern Paraguay

CONTENTS

A. Basic Information

Country:	Paraguay	Project Name:	Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay
Project ID:	P094335	L/C/TF Number(s):	TF-96758
ICR Date:	01/10/2017	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	ITAIPU BINACIONAL
Original Total Commitment:	USD 4.50M	Disbursed Amount:	USD 4.50M
Revised Amount:	USD 4.50M		
Environmental Category: B		**Global Focal Area: B**	

Implementing Agencies:
ITAIPU Binacional (IB) in cooperation with the Secretariat of Environment (SEAM) and the Ministry of Agriculture and Livestock (MAG)

Cofinanciers and Other External Partners:
ITAIPU, MAG/PRODERS, Beneficiaries

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	03/03/2005	Effectiveness:	07/25/2011	07/21/2011
Appraisal:	04/18/2008	Restructuring(s):		02/08/2013 02/28/2014 07/01/2014
Approval:	06/17/2010	Mid-term Review:	03/04/2013	05/16/2013
		Closing:	04/10/2014	04/10/2016

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Global Environment Outcome:	Moderate
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Moderately Satisfactory

Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
Overall Bank Performance:	Moderately Satisfactory	**Overall Borrower Performance:**	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at Any Time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at Any Time (Yes/No):	Yes	Quality of Supervision (QSA):	None
GEO Rating Before Closing/Inactive Status	Moderately Satisfactory		

D. Sector and Theme Codes

	Original	**Actual**
Sector Code (as % of Total Bank Financing)		
Other Agriculture, Fishing, and Forestry	40	40
Public Administration – Agriculture, Fishing, and Forestry	60	60
Theme Code (as % of Total Bank Financing)		
Biodiversity	70	70
Environmental Policies and Institutions	15	15
Land Administration and Management	15	15

E. Bank Staff

Positions	**At ICR**	**At Approval**
Vice President:	Jorge Familiar	Pamela Cox
Country Director:	Jesko S. Hentschel	Pedro Alba
Practice Manager/Manager:	Raul Ivan Alfaro-Pelico	Karin Erika Kemper
Project Team Leaders:	Ruth Tiffer-Sotomayor; Pablo Herrera	Marcelo Hector Acerbi
ICR Team Leader:	Ruth Tiffer-Sotomayor	
ICR Primary Author:	Francis V. Fragano	

F. Results Framework Analysis

Global Environment Objectives (GEO) and Key Indicators (as Approved)

The project objective was to assist the member country's continued efforts to achieve sustainable natural-resource-based economic development in the project area by (a) establishing the Mbaracayú–San Rafael Conservation Corridor within public and private lands through sustainable native forest management practices for biological connectivity; (b) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation; (c) strengthening the institutional capacity of the Ministry of Agriculture and Livestock (MAG) to implement conservation techniques in the rural landscape; (d) strengthening the institutional capacity of the Secretariat of Environment (SEAM) to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of such activities; and (e) strengthening the National Protected Areas System.

Revised Global Environment Objectives (as Approved by the Original Approving Authority) and Key Indicators and Reasons/Justifications

GEO was not revised, but key GEO indicators were revised during the third restructuring (July, 1, 2014).

(a) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1	**Land area where sustainable land management practices were adopted as a result of the project (Hectare (ha), Core)**			
Value (quantitative or qualitative)	0	250,000	120,000	125,015
Date achieved	11/27/2013	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 104%. Farmer subprojects: 11,187 ha. Indigenous Communities subprojects: 65,195 ha. Watershed Plans–PRODERS: 10,112 ha. Watershed Plans–ITAIPU-PYBIO: 8,100 ha. Honey-production subprojects: 9,954 ha. Others: 20,467 ha. ***Linkage to PDO:*** The corridor area is within the Oriental Region, the economic motor of the national economy of the country. The 125,015 ha area targeted in this indicator is per its nature, a productive landscape. The application of sustainable land management practices introduced by the project, contributed to a more sustainable natural resources-based economy. Sustainable agricultural practices diversified farms and increased productivity by protecting soil and water and by having other crops. This indicator contributes to this part of the PDO: encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	Land-management practices implemented are: (i) planting of yerba mate (endemic and commercial species) in mixed forested area, (ii) planting yerba mate in mixed farm plots (cassava, corn, beans, heart of palm, bananas); (iii) establishing apiculture systems for generating income and promoting pollination; (iv) planting native tree species[1] along rivers, ponds, and streams to improve habitat, reduce erosion, and protect micro-watersheds; (v) reducing use of herbicides through integrated pest control (application of natural-based products made with traditional knowledge of farmers and indigenous communities, with farmers receiving technical training and tool kits). Example. The project financed 413 farmers with the planting of 856 hectares of yerba mate under forest shaded. According to national data from MAG, these will produce 1,284,000 kg in the first harvest and 2,140,000 kg at the second harvest which will generate an estimated income of US$1,058,969 for all farmers or about US$2,564 each. The price of yerba mate at the farm is about 1800 Guaranies (US$0.30) per kg. A yerba mate plant can produce for 25 years. More details in Annex 10 (Causal Chains of Project Outcomes).			
Indicator 2:	**Number of hectares of Mbaracayú–San Rafael Conservation Corridor conserved (Hectare (ha))**			
Value (quantitative or qualitative)	165,734	250,000	231,159	233,353
Date achieved	11/27/2013	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 101%. An additional 67,619 ha area, over the baseline, comprised of: Reserve Pozuelo: 5,300 ha; Reserve Yguazu–ANDE: 1,785 ha; Estancia Carla Maria: 6,000 ha; Grupo FD: 2,931 ha; Agroganadera Pindo: 4,499 ha; Estancia Chololo: 2,704 ha; Reserve Yvyturuzu: 24,000 ha; San Rafael–SEAM: 500 ha; Indigenous Reserves: 13,000 ha; Guyra Reserve: 6,500 ha; and Acaray–ANDE: 400 ha. ***Linkage to PDO:*** This indicator measures conservation of forestland by the government and private sector, forming the backbone of the corridor by "Establishing the Mbaracayú–San Rafael conservation corridor within public and private lands through sustainable native forest management practices for biological connectivity." The practice utilized was the creation of private forest reserves by farmers, ITAIPU and the Government. The baseline included public and private protected areas: Caazapá NP: 16,000 ha; Ñacunday NP: 2,000 ha; six private reserves-ITAIPU: 40,000 ha; and the other private reserves of Mbaracayú: 64,406 ha; Morombi: 25,000 ha; Ypeti: 13,592 ha; and Tapyta: 4,736 ha.			
Indicator 3	**Number of hectares restored within the Mbaracayú–San Rafael Conservation Corridor (Hectare (ha))**			

[1]Native species planted: Yvyra pyta *(Peltophorum dubium)*, Lapacho *(Handroanthus impetiginosus)*, Petereby *(Cordia trichotoma)*, Guayaibi *(Patagonula americana)*, Cedro *(Cedrela fissilis)*, Inga *(Inga uruguensis)*, Guatambu *(Balfourodendrun redielianum)*, and Urundey *(Astronium balansae)*, among others.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Value (quantitative or qualitative)	0	30,000		36,254
Date achieved	11/27/2013	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 120%. Farmers subprojects: 1,547 ha; Indigenous communities subprojects: 759.05 ha; honey production under forests shade: 20,771 ha; ITAIPU restoration–Preserva Project: 1,200 ha; PRODERS restored areas: 62.8 ha; and others: 11,915 ha. ***Linkage to PDO**:* This indicator measured 36,254 ha that have been restored with the participation of farmers, Indigenous Peoples (IP) and ITAIPU. This indicator contributed to the establishment of the Mbaracayú–San Rafael conservation corridor within public and private lands through sustainable native forest management practices for biological connectivity. Restoration includes activities of reforestation with Atlantic Forest native species in degraded forest areas, or in areas with no forest cover; restoration of riparian areas where the forest has been cut; restoration of the shores of the ITAIPU and Iguazu reservoirs; restoration of small micro-watershed important for water use for communities. The average survival rate was very good (75%). Activities were monitored periodically by the Project Implementation Unit (PIU) Coordinators, the Sub-corridors Monitoring team, the Regional Co-implementing agencies, the Inter-American Institute for Agricultural Cooperation (IICA) team, and the Concurrent Technical Audit and the Bank supervision missions. Honey production in preserved forests is a restoration activity with native species as installation of bee hives has helped increase pollination from the forest remnants in the communities' areas.			
Indicator 4	**Number of producers that improve forest management and integrate biodiversity conservation into their productive activities (Number)**			
Value (quantitative or qualitative)	0	2,500	1,500	3,906
Date achieved	11/27/2013	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 260%. 1,232 PRODERS producers (each subproject includes two people who incorporate good environmental practices that favor biodiversity conservation); subprojects: 1,858 producers; and, subprojects in collective indigenous communities: 816 producers. ***Linkage to PDO:*** This indicator contributes to part (b) of the PDO: encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation. Despite this indicator being reduced during restructuring, the project exceeded both the original (2,500) and the formally revised targets (1,500). The interested producers were mainly small farmers with less than 20 hectares and indigenous communities. In addition, medium-size producers grouped in seven associations and cooperatives participated and benefited from the project. Each small producer signed an agreement with the regional implementation agencies to dedicate 1-2 hectares of his/her property to implement activities (subprojects) such as reforestation, agroforestry, watershed conservation, and			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	training, promoted by this project. In the case of the cooperatives, more land was offered by producer, about 10-20 hectares, to participate in the project and implement forest/biodiversity conservation activities in their farms. Example. The project benefited 255 farmers with 1200 bee hives boxes. According to national data (MAG), each box can produce 15 liters of honey per year (conservative estimate) and a liter of honey at the farm is paid approximately 25,000 Guaranies. Delivered bee hives can generate about 18,000 liters of honey for an approximate annual income of 450,000,000 Guaranies (US$ 77,466) for all beneficiaries or US$ 303 each per harvest. About 3 harvests can be collected per year. More details in Annex 10.			
Indicator 5	**Areas brought under enhanced biodiversity protection (Hectare (ha), Core)**			
Value (quantitative or qualitative)	165,734	400,000	310,799	311,735
Date achieved	11/27/2013	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 100.3%. An additional 146,001 ha area, over the baseline, comprised of: ITAIPU Pozuelo: 5,300 ha; Yguazu reserve: 1,785 ha; Reserve Yvyturuzu: 24,000 ha; SR/SEAM: 500 ha; San Rafael–Indigenous: 13,000 ha; San Rafael–Guyra: 6,500 ha; Yvera–SEAM: 2,000 ha; private reserves proposed to SEAM: 16,534 ha; and subprojects: 76,382 ha. ***Linkage to PDO****:* This indicator responds to parts (a), (b), and (e) of the PDO. It includes land in the corridor where biodiversity is being protected either by the government (public protected areas such as in San Rafael–SEAM, Yvera, Yvyturuzu, and Yguazu–ANDE); ITAIPU reserves (Pozuelo); private reserves; indigenous communities; and farmers. Biodiversity monitoring surveys confirmed the presence of 296 bird species that use the corridor's habitats, including endangered and endemic species such as Gray-bellied Hawk (*Accipiter poliogaster*), Saffron Toucanet (*Pteroglossus bailloni*), Bare-throated Bellbird (*Procnias nudicollis*), Helmeted Woodpecker (*Celeus galeatus*), Vinaceous Parrot (*Amazona vinacea*), and Rusty-barred Owl (*Strix hylophila*), among others.			
Indicator 6	**Number of hectares in 10 private protected areas (Hectare (ha))**			
Value (quantitative or qualitative)	10,7734	150,000	124,734	131,353
Date achieved	05/10/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 105%. Additional 23,619 ha over the baseline were brought under protection in additional seven private areas: RN Pozuelo–ITAIPU: 5,300 ha; RN Yguazu–ANDE: 1,785 ha; Estancia Carla Maria 6,000 ha; Grupo FD 2,931ha; Agroganadera Pindo: 4.499 ha; Acaray–ANDE: 400 ha and Chololo: 2,704 ha. ***Linkage to PDO:*** This indicator contributes to part (a) and (b) of the PDO. The boom in the commodities (mainly soy plantations) does not promote the conservation of forestland. Most forestlands belong to private owners (agribusiness companies, small and medium farmers, and Indigenous Peoples (IP); thus, the conservation of the additional 23,619 ha by these partners, as private reserves, is an important contribution for the forest connectivity sought in the corridor's agricultural landscape. The type of conservation			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	practice utilized, promotes not to cut the forest, but to create private forest reserves; since the forest in Paraguay has almost no value - for a farmer or agribusiness company - leaving a piece of forest standing in Eastern Paraguay is saving it from becoming a soy plantation.			
Indicator 7	**Improved capacity at SEAM and MAG for policy development in key priority environmental areas (Yes/No)**			
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. The Institutional Capacity Plan (investment of about US$500,000) supported capacity building to MAG and SEAM relating to diverse key policy and priority environmental areas for the corridor. – 100 staff from SEAM participated in 25 national and international trainings. These included Best International Practices for Management of Corridors; Forest Certification Methods; *Panthera Onca*–Seminar on Endangered Mammals; Instruments to Determine the Economic Cost of Environmental Damage; World Forestry Congress in Durban, South Africa; and COP 21–Paris. – 30 MAG/PRODERS staff benefited from 35 training courses on best practices for sustainable agriculture practices, agroforestry, apiculture, biodiversity protection, integrated pest management, conservation of watersheds, and environmental safeguards policies. ***Linkage to PDO.*** This indicator responds to parts (c), (d), and (e) of the PDO. SEAM's operational capacities improved through the construction of New Building for Direction of Protected Areas (600m^2); donation of 4x4 vehicles for patrolling; payment of salaries for two full-time staff in communication and project planning; and financing of six policies and regulations proposal studies, environmental education campaigns, and publications.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1	**Number of Subprojects granted for supporting sustainable use of biodiversity and natural resources (Number)**			
Value (quantitative or qualitative)	0	318	254	315
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	**Achieved**: 124%. Subprojects include: 245 subprojects for honey-production and planting of yerba mate, and tree fruits with small farmers; 47 honey-production subprojects with indigenous communities; and, 23 subprojects with efficient and solar cook stoves to reduce use of forest wood. ***Linkage to PDO:*** This indicator contributes to sustainable natural resource-based economic development, sustainable native forest management practices, and sustainable agricultural practices that increase production and farm diversification. The economy of the beneficiaries is completely deepened on natural resources and agriculture. The subprojects financed by this project included the planting of tree fruit species important for family food, for selling in the market, but also for the birds, bats and insects. The installment of bee hives as subprojects helped to improve pollination of farmers' crops and forest tree species, but also created an additional cash crop for the family (honey) for sale. Example. The project financed the installment of 1200 bee hives boxes. According to national data (MAG), each box can produce 15 liters of honey per year (conservative estimate) and a liter of honey at the farm is paid approximately 25,000 Guaranies. Project bee hives will generate about 18,000 liters of honey for an approximate annual income of 450,000,000 Guaranies (US $ 77,466) for all beneficiaries. About 3 harvest can be collected per year. More details in Annex 10.			
Indicator 2	**Number of subprojects for habitat restoration or regeneration supported (Number)**			
Value (quantitative or qualitative)	0	278	222	797
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**: 360%. 773 subprojects with farmers (687 GEF, 110 ITAIPU) and 24 subprojects with indigenous communities. ***Linkage to PDO:*** This indicator contributes to sustainable natural-resource-based economic development and sustainable native forest management practices. Example: Yerba mate was planted with native forest cover of about 187 trees per hectare which can produce 120 m^3 of wood after 12-15 years or 1,320 m^3 of Alto Parana wood (local unit) which a market price for precious wood from the Eastern region is about 50,000 Guaranies[2] (US$8.61) per m^3 of Alto Parana, for an income of about 66,000,000 Guaranies (US$ 11,340) per hectare. More details in Annex 10.			
Indicator 3	**Number of subprojects for environmental socio-productive initiatives supported (Number)**			
Value				

[2] MAG-GTZ-KWf. 2011. *Manejo Forestal y Agricultura de Conservación. Experiencias de pequeños productores en la Región Oriental de Paraguay. Proyecto Manejo Sostenible de Recursos Naturales*

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
(quantitative or qualitative)	0	358	286	339
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**: 118.5%. 21 subprojects with farmers; 201 subprojects with indigenous communities (honey production); and, 117 subprojects of PRODERS (in 6 micro-watersheds). ***Linkage to PDO:*** This indicator contributes to sustainable natural resource-based economic development, sustainable native forest management practices, sustainable agricultural practices that increase production, and farm diversification. Subprojects included plating of eucalyptus for firewood and sale of wood, installment of bee hives for honey production, organic production, among others. Example. The project supported the planting of 471 hectares of eucalyptus which represent a future income of about US$ 5,985,468 for 826 small farmer's beneficiaries of the project after the tree cycle (10 years). More details in Annex 10.			
Indicator 4	**Number of micro-catchment areas planned in a participatory way (Number)**			
Value (quantitative or qualitative)	0	75	20	20
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 100%. Micro-watershed participatory planning performed by PRODERS (10 micro-watersheds); Paraguay Bio Project: 10 micro-watersheds distributed in 10 regions in the corridor. 340 beneficiaries and 15 staff from MAG/PRODERS participated in project workshops. ***Linkage to PDO:*** This indicator contributes to sustainable natural-resource-based economic development, sustainable native forest management practices. Water is critical for farm production especially in the dry seasons and for local consumptive use. In the corridor, the conservation of micro-watersheds contributed to reduced erosion and increased habitat for fauna. The corridor is the site of the headwaters of important tributaries feeding the country's two main hydropower plants and serving as the main waterway for the export of cash crops.			
Indicator 5	**Number of new management plans for existing public protected areas are created in a participatory way (Number)**			
Value (quantitative or qualitative)	1	3	4	3
Date achieved	05/07/2013	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Partially Achieved**. Caazapá protected area (included in the baseline); Ñacunday protected area (completed); Ybytyruzu protected area (completed); and San Rafael protected area was partially completed with two national dialogues and two collaboration agreements.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	Linkage to PDO: This indicator contributes to the strengthening of SEAM and the National Protected Areas System (SINASIP). This indicator was partially achieved because it was not possible to conclude the management plan for the San Rafael Protected Area because SEAM, the IP, and NGOs have a different vision for San Rafael. Nevertheless, the project achieved—for the first time since the creation of San Rafael in 1992—two encounters with all the main stakeholders and the government to initiate dialogue, exchange plans, and discuss opportunities for forest management and local livelihoods. The Paraguay Bio Program and SEAM will follow up on agreements.			
Indicator 6	**Number of protected areas under implementation with management plans (Number)**			
Value (quantitative or qualitative)	1	4	4	3
Date achieved	04/03/2014	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Partially Achieved**. Infrastructure developed for park rangers in Ñacunday and in Caazapá, design of nature trail system for ecotourism, environmental monitoring, and environmental education activities. Supported the land title and the national decree of Ñacunday as a national park for SEAM. In San Rafael, the project supported the land title registration for SEAM of 500 ha donated by the NGO Guyra, and supported biodiversity surveys and publication of brochures for the protected areas regarding the main species and main conservation issues. ***Linkage to PDO:*** This indicator contributes to the strengthening of SEAM and the SINASIP.			
Indicator 7	**Number of protected areas under implementation with management plans that have infrastructure in place (Number)**			
Value (quantitative or qualitative)	0	2		2
Date achieved	04/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved.** 100% Infrastructure developed for park rangers in Ñacunday and in Caazapá. ***Linkage to PDO:*** This indicator contributes to the establishing the Mbaracayú–San Rafael conservation corridor within public and private lands through sustainable native forest management practices for biological connectivity and to the strengthening of SEAM and the SINASIP.			
Indicator 8	**Number of protected areas previously lacked formal land title that have adjusted their legal and administrative situation (Number)**			
Value (quantitative or qualitative)	0	3	2	2
Date achieved	04/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved.** 100%. The project has facilitated the formal land titling in the national public registry of 500 ha in San Rafael that the NGO Guyra Paraguay donated to SEAM. The project also supported the land titling of Ñacunday National Park to SEAM.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	Linkage to PDO: This indicator contributes to establishing the Mbaracayú–San Rafael Conservation Corridor within public and private lands and to strengthening SEAM and the SINASIP.			
Indicator 9	**Number of private protected areas that have been proposed to SEAM for creation (Number)**			
Value (quantitative or qualitative)	4	10		11
Date achieved	04/03/2014	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 110%. Additional seven reserves over the baseline were formed: RN Pozuelo–ITAIPU (5,300 ha); RN Yguazu–ANDE (1,785 ha); Estancia Carla Maria (6,000 ha); Grupo FD (2,931 ha); Agroganadera Pindo (4,499 ha); Acaray–ANDE (400 ha); and Chololo (2,704 ha). Total area = 23,619 ha. ***Linkage to PDO:*** This indicator contributes to establishing the Mbaracayú–San Rafael conservation corridor within public and private lands through and to strengthening SEAM and the SINASIP.			
Indicator 10	**Number of hectares legally recognized as private protected areas that have been proposed to SEAM for creation (Hectare (Ha))**			
Value (quantitative or qualitative)	10,773	150,000	124,734	131,353
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 105% achievement with 23,619 ha formed by: RN Pozuelo–ITAIPU (5,300 ha); RN Yguazu–ANDE (1,785 ha); Estancia Carla Maria (6,000 ha); GrupoFD (2,931ha); Agroganadera Pindo (4,499 ha); Acaray–ANDE (400 ha); and, Chololo (2,704 ha). ***Linkage to PDO:*** This indicator contributes to establishing the Mbaracayú–San Rafael conservation corridor within public and private lands through sustainable native forest management practices (creation of private reserves) for biological connectivity and to strengthening SEAM and the SINASIP.			
Indicator 11	**Hectares of restored forest within a defined, created and implemented corridor (Hectare (Ha))**			
Value (quantitative or qualitative)	0	1,000		2,080
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 208%. 1,080 ha restored in the Carapa Corridor (biodiversity and restoration currently being monitored by ITAIPU) and 1,000 ha restored of ITAIPU's Preserva Corridor restoration program. ***Linkage to PDO:*** This indicator contributes to establishing the Mbaracayú–San Rafael conservation corridor within public and private lands through sustainable			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	native forest management practices for biological connectivity and to strengthening of SEAM and the SINASIP.			
Indicator 12	**Number of client demand-driven studies (including action plans to implement activities) developed for improved policy instruments (Number)**			
Value (quantitative or qualitative)	0	6		7
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 116%. SEAM requested the project to prepare six technical studies and policy proposals for policy making and new regulations; the project achieved seven. These included Proposal for an Environmental Fund– Law 3001/0; Development of Generic Environmental Management Plans – Law 294/93; Proposed Methodology for Assessment of Environmental Damage; and Hydrological Study–Tebicuary River. ***Linkage to PDO****:* This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities. The seventh proposal was used by SEAM to issue the National Resolution that creates the corridor and declares its restoration a national priority (R185-2016).			
Indicator 13	**Technical proposals of regulatory norms available, to enable the implementation of the Payments for Environmental Services law (Law 3001) (Yes/No)**			
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. The project prepared a proposal for the creation of an Environmental Fund that could allow the capture of income from the PES program as well as of funding from other sources. This proposal was prepared together with SEAM staff. A public presentation and consultation was held with participation of SEAM, Ministry of Finance, Environmental Fund–USAID, and local experts. ***Linkage to PDO:*** This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 14	**Technical proposals of regulatory norms available, to enable the implementation of the Land Use Planning Law (Law 3966/10) (Yes/No)**			
Value (quantitative or qualitative)	N		Y	Y
Date achieved	07/01/2014		07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. A land-use plan for environmental management plan was prepared by land-use planning experts in the District of Mbaracayú, close to the private reserves of Mbaracayú in Alto Paraná, in order to pilot a land-use planning tool to improve biodiversity conservation.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	Linkage to PDO: This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 15	**Technical studies to enable the implementation of the Watersheds law (Law 3239/07) (Yes/No)**			
Value (quantitative or qualitative)	N		Y	Y
Date achieved	07/01/2014		07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. The project financed the preparation of a hydrological study of the upper river basin of Rio Tebicuary. This river's headwaters are in the San Rafael Protected Area and the lower basin is the most important water source for many local communities and rice producers, but extreme water extractions are affecting biodiversity and water quality. Three technical workshops were organized to prepare the study with the Water Directorate Department from SEAM and other government agencies to share the study's final results. ***Linkage to PDO:*** This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 16	**A study on "Economic Value of Natural Resources and Environmental Services of the Forests" to support an economic assessment of the impacts of deforestation. (Yes/No)**			
Value (quantitative or qualitative)	N		Y	Y
Date achieved	07/01/2014		07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. The project financed the preparation of a proposal/methodology for the economic measurement of environmental damage, which was developed in close coordination with SEAM staff. In addition, two trainings were provided to SEAM and members of the Judicial System to learn on the application of the proposed methodology. About 100 staff trained. ***Linkage to PDO:*** This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 17	**Technical proposals of regulatory norms available, to enable the implementation of the regulation on Environment Impact Assessment (EIA) (Decree 453/13 and Law 294/93) on areas/themes that are compatible with the project's scope (Yes/No)**			
Value (quantitative or qualitative)	N		Y	Y
Date achieved	07/01/2014		07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. The project hired national experts to develop a set of 20 Generic Environmental Management Plans (EMP) to serve in the following sectors: infrastructure and services, agriculture, forest sector, agroindustry, among others.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	Proposed EMPs were developed in closed coordination with SEAM and in consultation with sectoral experts. ***Linkage to PDO:*** This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 18	**Technical proposals of regulatory norms available, to enable the implementation of the SINASIP (Law 352/93) (Yes/No)**			
Value (quantitative or qualitative)	N		Y	Y
Date achieved	07/01/2014		07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. The project financed an International Forum to discuss the challenges of protected areas, forest conservation, and biodiversity affecting the Atlantic Forest. The Minister of Environment, the Director of ITAIPU, and more than 600 people participated, including government officials from all sectors, international local experts, and civil society. The forum debates provided diverse proposals and recommendations to Paraguay on how to improve the SINASIP and the biodiversity monitoring, promote the corridor, and improve policy making for forest conservation. http://www.paraguaybio.com.py/forocorredoresbiologicos/ ***Linkage to PDO:*** This indicator contributes to strengthening the institutional capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of said activities.			
Indicator 19	**Environmental themes are implemented in programs for elementary school education (Yes/No)**			
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 108 training events were provided on environmental themes for 580 teachers and members of the educational system from 180 schools and from 6 departments, with a total of 5,445 participants. Because of the program's impact, the Ministry of Education has formally declared this program to be in the public interest and is being included in the country's official national curriculum. As part of the educational activities, children planted trees; received educational materials, images, and messages (games, puzzles, papers with seeds, and so forth) related to protected areas, forests, and endangered species; teachers received large-format full-color materials to increase knowledge of the Atlantic Forest, the corridor, and the protected areas; and so forth; so these can be used in rural areas without electricity. ***Linkage to PDO:*** This indicator support all outcomes of the PDO as a cross-cutting area that increases public awareness on the citizen and future generations of the fragility of the Atlantic Forest ecosystems which can have multiple benefits in the family and communities of the corridor and nationwide.			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 20	**Number of training events carried out (Number)**			
Value (quantitative or qualitative)	0	200	80	109
Date achieved	05/13/2010	06/17/2010	07/01/2014	04/10/2016
Comments (incl. % achievement)	**Achieved**. 136%. 109 training events carried out on biodiversity, corridors, agroforestry, integrated pest management, forest certification, safeguards policies, environmental education, and valuation of environmental impact, among other topics. Detailed course material and descriptions are available at the PIU. ***Linkage to PDO:*** This indicator supports the strengthening of institutional capacity of the Ministry of Agriculture and Livestock (MAG) and the Ministry of Environment (SEAM), but also to staff of other institutions such as National Forestry Agency (INFONA), National Indigenous Peoples Institute (INDI), Supreme Court, *Ministerio Público* (Public Prosecutor Office), municipalities, and beneficiaries (farmers, IP, NGOs, cooperatives, and so on).			
Indicator 21	**Dissemination plan in place and operating (Yes/No)**			
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. National Communication Plan (news, internet, road signs, radio, videos, and YouTube); International dissemination plan: COP21– Paris; World Forestry Congress in Durban, South Africa; and International Forum on Corridors and Protected Areas, among others. Project websites: http://www.paraguaybio.com.py/noticias.html https://www.facebook.com/ParaguayBio/ http://www.ITAIPU.gov.py/es/sala-de-prensa/noticia/paraguay-biodiversidad html ***Linkage to PDO:*** This indicator contributes to the overall achievement of the PDO.			
Indicator 22	**Decentralized Project coordination unit functioning satisfactorily, including a Project integrated management information system. (Yes/No)**			
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. PIU staffed with 10 permanent staff from ITAIPU and 20 consultants. Project Management System Tool created and operating; the system improved project management, monitoring, and coordination with the many partners across the corridor, the Bank, and institutions. ***Linkage to PDO:*** This indicator contributes to the overall achievement of the PDO.			
Indicator 23	**A financial, physical, and ecological monitoring system in place and providing accurate information to users and the audience (Yes/No)**			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Value (quantitative or qualitative)	N	Y		Y
Date achieved	05/13/2010	06/17/2010		04/10/2016
Comments (incl. % achievement)	**Achieved**. 100%. Both monitoring systems achieved. Project Management System fully operational. Biological monitoring tool financed and operating at the National Natural History Museum. ***Linkage to PDO:*** This indicator contributes to the overall achievement of the PDO and to establishing the Mbaracayú–San Rafael Conservation Corridor and to strengthening SEAM and the SINASIP.			

G. Ratings of Project Performance in ISRs

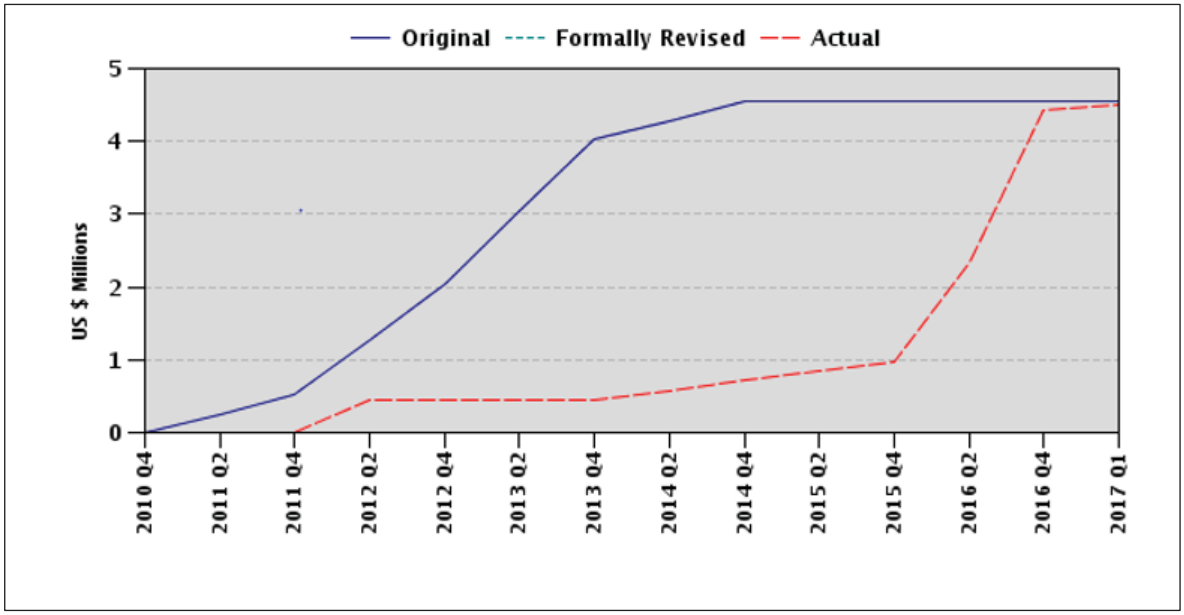
No.	Date ISR Archived	GEO	IP	Actual Disbursements (USD Millions)
9	01/04/2011	Moderately Satisfactory	Moderately Satisfactory	0.00
10	09/06/2011	Moderately Satisfactory	Moderately Satisfactory	0.00
11	05/14/2012	Moderately Unsatisfactory	Moderately Satisfactory	0.45
12	11/17/2012	Moderately Unsatisfactory	Moderately Unsatisfactory	0.45
13	06/20/2013	Unsatisfactory	Unsatisfactory	0.45
14	11/05/2013	Unsatisfactory	Moderately Unsatisfactory	0.45
15	02/08/2014	Moderately Unsatisfactory	Moderately Satisfactory	0.56
16	04/12/2014	Moderately Unsatisfactory	Moderately Satisfactory	0.56
17	11/03/2014	Moderately Satisfactory	Moderately Satisfactory	0.84
18	05/08/2015	Moderately Unsatisfactory	Moderately Unsatisfactory	0.96
19	08/31/2015	Moderately Satisfactory	Moderately Satisfactory	2.11
20	04/10/2016	Moderately Satisfactory	Moderately Satisfactory	4.18

H. Restructuring (if any)

Restructuring Date(s)	Board Approved GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD Millions	Reason for Restructuring & Key Changes Made
		GEO	IP		
02/08/2013	N	MU	MU	0.45	Institutional Arrangements. Management Council to be chaired by ITAIPU instead of SEAM.

Restructuring Date(s)	Board Approved GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD Millions	Reason for Restructuring & Key Changes Made
		GEO	IP		
02/28/2014	N	MU	MS	0.56	Project closing date extended for 2 years.
07/01/2014	N	MU	MS	0.71	PDO indicators were simplified and targets were revised as explained in section 1.3 of this ICR.

I. Disbursement Profile



1. Project Context, Global Environment Objectives, and Design

1.1 Context at Appraisal

1. Paraguay is a landlocked country of 406,750 km^2 with an estimated population of six million. With regard to inequality, the richest 10 percent of the population accounted for 42 percent of total income, while 2 percent of the agricultural establishments (about 6,400 farms) occupied almost 82 percent of the agriculturally exploited land (namely, 20 million of the 24 million hectares (ha) in agricultural use, or one-half of Paraguay's total area of 40 million ha). At the time of project appraisal, a coalition, the *Alianza Para el Cambio*, headed by President Fernando Lugo had recently come to power, breaking the hold on the Presidency of Paraguay of more than half a century by the Colorado Party which generated political changes in the country context and in all government institutions including those involved in the project.

2. Paraguay is among the top ten countries in the globe reporting the greatest annual net loss of forestland. In the most recent Global Forest Resources Assessment from FAO, it was determined that between 2010 and 2015, 325,000 ha/per year (a rate of 2% of forests) were lost in Paraguay.[3] Paraguay has been subject to some of the highest deforestation pressures in Latin America. INFONA, the National Forestry Agency, reported that between 1990 and 2011, about 25% of forestland was lost at a rate of 250,000 ha per year. During this period, deforestation significantly affected the Upper Paraná Atlantic Forest (UPAF—forests east of the Paraguay River) where 96% of the population lives, and where the agricultural expansion of commodities (mainly soybeans and beef) has been concentrated, causing the loss of forest and biodiversity. The high level of poverty within Paraguay has also had a significant impact contributing to the degradation of the country's natural resources. Deforestation of the Atlantic Forest has slowed down because little forest is left and due to the Zero Deforestation law. It is estimated that less than 6% of Atlantic forest remains. This remaining forest is found mainly in protected areas, farmland, the indigenous community's communal land, and private reserves.

3. The remaining UPAF is highly fragmented. The elimination of large areas of forest initially for cattle grazing followed by mechanized soybean and grain production has left the UPAF highly fragmented with only a few remnants that can maintain long-term population of its fauna and flora. Recent maps of remaining forests cover showed it to be highly fragmented. Some of these forest patches are protected areas (San Rafael, Ñacunday, Ybyturuzu, and Mbaracayú), but the government provides little protection and only the ITAIPU reserves (700,000 ha) and the Mbaracayú Forest Nature Reserve, which received assistance from a GEF grant (P066225), have permanent protection.

4. To support the Government of Paraguay's (GoP's) efforts to begin restoring the UPAF and maintain connectivity in the landscape through the establishment of corridors (the

[3] FAO 2015. Global Forest Assessment (FRA 2015). Rome.

groundwork for which had been planned over several decades), the Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay Project was prepared.

5. The implementing agency selected for this project was ITAIPU Binacional (ITAIPU), the largest hydropower plant in Latin America and the second largest in the world (14,000 Megawatts). ITAIPU, which is jointly owned by the governments of Brazil and Paraguay, built a dam on the Paraná River to generate energy for both countries. This dam provides most of Paraguay's electricity and generates a significant amount of foreign exchange through the sale of surplus power to Brazil; ITAIPU is the country's main source of public revenue. ITAIPU has a strong environmental corporate mandate to participate in the conservation of the Upper Paraná River Basin in order to reduce erosion which can affect the operation of the plant and also for compensating the legacy of the environmental and social impact caused during its construction decades ago. ITAIPU owns about 70,000 hectares of Atlantic forest along the shore of the ITAIPU reservoir that represents the largest tract forest corridor in the country that extends for more than 1,500 km. The ITAIPU hydro plant is also leading the largest restoration project in the country through its Preserva Program, which aims to reforest 2,060 ha of degraded land with native species. For this project, all ITAIPU reserves are included in the corridor and 1,200 ha reforested by the Preserva Program were included in the project.

1.2 Original Global Environment Objectives (GEO) and Key Indicators

6. The Objective of the Project was to assist the Member Country's continued efforts to achieve sustainable natural–resource–based economic development in the project area by (a) establishing the Mbaracayú–San Rafael Conservation Corridor within public and private lands through sustainable native forest management practices for biological connectivity; (b) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation; (c) strengthening MAG's institutional capacity to implement conservation techniques in the rural landscape; (d) strengthening SEAM's institutional capacity to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of such activities; and (e) strengthening the National Protected Areas System (SINASIP). The PDO was agreed to be achieved by the implementation of these five pillars (a,b,c,d,e) after a long process of consultation and discussion with the GoP, ITAIPU, NGOs and local and international experts.

7. There are no differences between the PDO/GEO in the PAD and the Legal Agreement.

8. Key indicators and targets for the PDO were included as follows in the original PAD[4]: By the end of the project: (i) 250,000 ha of land within the productive landscape are under sustained effective management for conservation and production, based on the GEF SP2 Tracking Tool; (ii) an estimated 250,000 ha of the Mbaracayú–San Rafael Conservation

[4] The Results Framework (RF) on page 38 of the PAD is considered the Original Results Framework, not the arrangements for Results Monitoring Table on page 45 of the PAD.

Corridor are conserved, and 30,000 ha are restored within the corridor; (iii) 2,500 farmers have improved forest management and integrated biodiversity conservation into their productive activities; (iv) an increase of at least 150,000 ha in 10 private protected areas reserves, and 250,000 ha of the public system have been strengthened, based on the GEF SP1 Tracking Tool; (v) SEAM and MAG's capacity for policy development in the areas of tradable rights and forest conservation has been improved; (vi) disincentives for the unsustainable use of natural resources have been instituted; (vii) certification of sustainably produced products has been created; and (viii) mechanisms to provide ecosystem services have been put into operation.

1.3 Revised GEO (*As Approved by Original Approving Authority*) and Key Indicators, and Reasons/Justification

9. The PDO/GEO was not revised. The project had three restructurings:

1. February 8, 2013: The management council coordinating agency was changed.
2. February 28, 2014: The original closing date (April 10, 2014) was revised.
3. July 1, 2014: Some of the PDO/GEO and intermediate indicators were adjusted.

10. During the first restructuring, institutional arrangements were changed to facilitate implementation, revising the role of partner entities with a stronger mandate for ITAIPU. In the second restructuring, the project was extended for two additional years with a closing date of April 10, 2016. In the third restructuring, targets and wording of some indicators and a few outputs were adjusted based on the outcomes of the midterm review (May 16, 2013). The targets of the indicators were revised to levels that were more attainable within the remaining implementation period and due to the larger than expected proportion of small-scale producers participating in the project who required more technical and financial assistance.

11. The PDO/GEO and intermediate indicators and the targets were changed including the use of core sector indicators, as follows:
GEO indicators: (i) the end target for "land area where sustainable land management practices were adopted as a result of project" (Hectare (ha), Core)," was reduced from 250,000 ha to 120,000 ha (by 52%); (ii) the end target for "Number of hectares of Mbaracayú–San Rafael Conservation Corridor conserved" was reduced from 250,000 ha to 231,159 ha (by 7.5%); (iii) the end target for "Producers that improve forest management and integrate biodiversity conservation into their productive activities" was reduced from 2,500 to 1,500 (by 40%); (iv) the end target for "Areas brought under enhanced biodiversity protection (ha)" was reduced from 400,000 ha to 310,799 ha (by 22.3%); and (v) the end target for "Number of hectares in 10 private protected areas/reserves" was reduced from 150,000 ha to 124,734 ha (by 16.8%). Core Sector indicators replaced a few of the original PDO indicators.

12. Some of the target numbers of some original indicators were adjusted because (i) proposed activities were already being implemented by other initiatives, and (ii) the timeframe left for the project was limited to implement longer-term targets (such as capacity-building training events, restoration and for improving land use practices and restoration activities). The

revisions also took into consideration the reduction in contributions made by the Sustainable Agriculture and Rural Development project (PRODERS)[5] in the corridor area.

1.4 Main Beneficiaries

13. **Land Users.** In this category, four different types of beneficiaries were identified in the project area at project entry: large farmers, medium-sized farmers, small farmers or *campesinos*, and indigenous communities. At the end of the project most beneficiaries were small famers (2,500) and indigenous communities (2,283 families that represent approximately 10,636 people). The project established innovative partnerships with medium and larger producers in Eastern Paraguay for technical assistance and support for restoration initiatives. These producers included, for example, Agro-silo and Chololo SRL cooperatives (an innovative partnership to support sustainable heart of palm production within forestlands) as implementing partners.

14. **Indigenous People (IP).** This is the largest beneficiary group in the project with about 40% of the funds allocated for the implementation of subprojects addressed to these communities. The Indigenous communities as well as organizations working with IP in the region (such as *Asociación Cultural Popular Canindeu*, *Asociación Yvy Marane'y*, *Asociación Madre Tierra*) benefited and partnered the PIU in the implementation of the project. The local IP implementing groups included *Asociación Cultural Popular Canindeu*, *Asociación Yvy Marane'y*, *Asociación Madre Tierra*, *Comunidad Ache Puerto Barra*, *Asociación Nande Ru Simeon Delgado*, among others.

15. **Government.** The beneficiaries in the government include staff at central ministries and local governments, including the Secretariat of Environment (SEAM), Ministry of Agriculture and Livestock (MAG), National Indigenous People Institute (INDI), National Forestry Agency (INFONA), Public Administration Ministry, Ministry of Education, and 55 municipalities.

16. **Civil Society.** Twenty Non-Governmental Organizations (NGOs) were beneficiaries, able to advance their sustainability and conservation objectives and function as service providers, including long-standing organizations dedicated to conservation and sustainable production at local and national levels.

1.5 Original Components (As Approved)

17. **Component 1: Re-establishment of Connectivity between Protected Areas (Total US$ 12.005 M of which $ 1.815 M funded by the GEF).** This component supports the PDO outcome of establishing the Mbaracayú-San Rafael conservation corridor within public and private lands, advance sustainable natural-resource based economic development, and encourage sustainable agricultural practices that maintain biodiversity. The component

[5] The Sustainable Agriculture and Rural Development project (PRODERS) (P088799) was originally proposed as a co-financing source of the Paraguay Bio Project, as indicated in page 6 of the PAD.

included: the provision of Community Grants I to carry out demand-driven investments on: (a) sustainable use of forest remnants to generate income while conserving biodiversity; (b) restoration and regeneration of forests to combat habitat degradation and erosion of land in areas with degraded or no forests; and (c) any other investment of similar nature. Also, the provision of Community Grants II to carry out demand-driven socio-productive investments on: (a) adoption of sustainable land use practices; (b) increasing crop and livestock (small animals) production; (c) forest and water conservation practices at farm levels; (d) diversification and improvement of production systems to increase income; (e) adoption of increased carbon sequestration practices; and (f) any other investment of similar nature.

18. **Component 2: Strengthening and Expansion of the National Protected Areas System (SINASIP) (Total US$ 1.815 M of which US$ 0.57 M funded by the GEF).** This component was aimed at achieving the outcome of strengthening the SINASIP as well as strengthening SEAM's institutional capacity. The component financed the following activities: Strengthening the management of existing Public Protected Areas and ITAIPU-Owned Protected Areas through the carrying out of: (a) the development and approval of voluntary management plans for the Caazapá National Park, the Ybyturuzú Managed Resource Reserve and the Ñacunday National Park; (b) the implementation of voluntary management plans for the Caazapá National Park, the San Rafael Managed Resource Reserve, the Ybyturuzú Managed Resource Reserve and the Ñacunday National Park; (c) the provision of technical assistance to design a demarcation plan of the area covered by the Ybyturuzú Managed Resource Reserve and the Ñacunday National Park; and (d) the carrying out of selected infrastructure investments in the Caazapá National Park and the San Rafael Managed Resource Reserve, which investments consist of rehabilitation of roads (within the existing right-of-way), the construction of park ranger posts, and the installation of a radio system for the communication among park rangers. Promoting the establishment of Private Protected Areas, through the carrying out of: (a) the elaboration of proposals for the creation of 10 new Private Protected Areas; and (b) the development of at least six voluntary management plans for existing or new Private Protected Areas. Establishment of a biological sub-corridor (within the Mbaracayú-San Rafael conservation corridor) named as the Carapá Biological Sub-Corridor, through the carrying out of: (a) the definition of micro-corridors; (b) the restoration of natural habitats within said sub-corridor; and (c) the implementation of management plans for six ITAIPU-Owned Protected Areas.

19. **Component 3: Enhanced Policy Framework and Institutional Strengthening (Total US$ 2.951 M of which US$ 1.685 M would be funded by the GEF).** This component focused on the outcomes (c) and (d) of the PDO, as part of the approach to improve institutional capacities and policies of the key public institutions focused on supporting and providing incentives for sustainable natural resource based economic development in the UPAF. The component financed the following capacity building activities: (a) the provision of training to staff of selected Municipalities and Departments on environmental management; (b) the acquisition and utilization of selected equipment and vehicles to assist SEAM in the carrying out of its functions and responsibilities; and (c) the provision of training to MAG's staff on biodiversity conservation techniques in the rural landscape of the Mbaracayú-San Rafael conservation corridor. Carrying out of communication and Project dissemination activities. Carrying out of activities aimed at encouraging sound management of natural resources, and

at addressing major gaps in knowledge for sound decision-making on incentives for natural resource management.

20. **Component 4: Project Management, Monitoring and Evaluation (Total US$ 1.52 M of which US$ 0.43 M would be funded by the GEF).** This component objective was to finance these activities: (a) Design and implementation of a Project monitoring and evaluation system; (b) Design and implementation of a land-use monitoring system and (c) Design and implementation of a Project integrated management information system.

1.6 Revised Components

21. The Midterm Review (MTR) led to various adjustments in the project design:
Component 2: (i) The voluntary management plan for the Caazapá National Park was reoriented towards the San Rafael Managed Resource Reserve (SRMRR), since the management plan for the Caazapá National Park had already been developed outside the project, by other organizations supporting SEAM. (ii) The implementation of infrastructure investments in the SRMRR was reoriented towards the Ñacunday National Park, given there were no public lands within the reserve and no management plan to strategically guide those infrastructure investments. (iii) The number of hectares legally recognized as private protected areas that were proposed to SEAM for creation was slightly reduced from 150,000 ha to 124,734 ha, following the results of a study that concluded it was not feasible to create 10 new private protected areas. This revision was reflected in the third restructuring.

22. Component 3: (i) Dissemination of the National Environmental Policy and the National Strategy for Biodiversity Conservation was canceled, since this policy and strategy had already been disseminated outside the project as the government secured funding from other sources. (ii) Design of land-use plans for selected municipalities and design of a system to monitor compliance with the land-use plans mentioned were canceled, because of the lack of sufficient time to execute these activities and because other organizations had developed equivalent land-use monitoring systems nationally. (iii) Design and implementation of a pilot program on tradable rights (*derechos canjeables*), certification of labeling/marketing of sustainably produced items, and development of a study on the mechanism to provide ecosystem services by the recipient were replaced by a new set of studies requested by SEAM aimed at improving the implementation of local environmental policies and legal framework. These activities of Component 3 (iii) aimed at encouraging sound management of natural resources and at addressing major gaps in knowledge for sound decision-making on incentives for natural resource management in the corridor and other regions of the country.

23. Component 4: (i) Design and implementation of a land-use monitoring system was canceled, because of the lack of sufficient time to execute the related activities and available the project other land-use monitoring systems. (ii) The project’s monitoring and evaluation system to be designed and implemented was proposed to refocus on assessing the project's impacts on biodiversity, as well as the project's contributions regarding poverty alleviation.

1.7 Other Significant Changes

24. In the July 1, 2014 restructuring, the composition of the project's Executive Working Group was extended to incorporate the National Indigenous Peoples Institute (INDI) as a permanent member, to support the participation of the different IP organizations present in the project's area; as well as to facilitate the resolution of any conflict or controversies that might eventually arise with these groups. The Sustainable Rural Development Project (PRODERS project (P088799) originally included as co-additional financing of the Paraguay Bio Project, included Additional Financing (AF) (P148504) to expand its area of action as well as its lifespan with the above restructuring. This project was expanded as co-funding to leverage implementation of biodiversity conservation practices beyond the original focus of Caaguazú department.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design, and Quality at Entry

25. **Project preparation.** Project preparation started in 2005 and finalized in 2010. Following the PCN Meeting held in March 2005, the project went into hibernation for almost two years due to a number of GEF-related issues, including the reduction in allocation of the Resource Allocation Framework (RAF) during the transition from GEF 3 to GEF 4. The Project GEO responded to the need to move to a landscape-management based focus in the Upper Paraná Atlantic Forest of Paraguay (UPAF) which at the time of project preparation was going through a fast degradation. The government of Paraguay recognized that a conservation strategy for the UPAF focused only on core protected areas was financially unsustainable given both the cost of land and the huge landscape involving millions of hectares and the economic model chosen of commodities expansion. Therefore, it was decided that the Project would complement the IBRD Sustainable Rural Development Project (P094335) which objective was the reduction of poverty in rural farmers. This combined IBRD/GEF Project proposal would promote biodiversity conservation in the rural environment by combining agricultural, forestry and capacity building activities within a holistic context of ecosystem and natural resources management. The Quality Enhancement Review (QER) was held on February 27, 2008. Board Approval occurred on June 17, 2010. Effectiveness was on July 25, 2011.

26. **Project design.** The design of the project focused proposing interventions in a large corridor where all types of producers cover the Atlantic Forest landscape. Large landowners own most of the land and they are largely noncompliant with minimum forest coverage requirements so there was an important potential for landscape interventions primarily focused on incentives rather than enforcement given the weak institutional capacities at national and local levels for this. Additionally, there were covering the UPAF landscape can benefit and contribute to increase connectivity of the Atlantic Forest remnants. The main objective of this Project was the conservation and restoration of biodiversity through mechanisms to promote mainstreaming of biodiversity within the productive landscape, incorporating the integrated management of ecosystems, and the creation of opportunities for the sustainable use of natural resources. The Project design reflected lessons learned from other GEF projects in the country

and in the Southern Cone[6] (particularly those focused on the Atlantic Forest and biodiversity corridors), including the importance of recognizing the expertise and views of local people and creating a sense of shared ownership of resources and of subproject design.

27. The project design provided many opportunities to involve large landowners, small producers through existing production programs and IP who still have significant remnants of forests. These lessons also emphasize the key role of stakeholder engagement (local communities dependent upon conservation for their livelihoods and quality of life, farmers' organizations, NGOs, etc.) in direct biodiversity conservation activities in the UPAF as well as of a communication strategy to ensure transparency and results dissemination. Finally, the design stressed the relevance of the provision of technical assistance by the project during and beyond the duration of the Project for achieving sustainable, long-term impacts.

28. The theory of change for the project sought to generate a mosaic of restored and conserved forest through the synergy of interventions and investments in sustainable production (to provide incentive to maintain the areas), landscape planning (to ensure connectivity in strategic areas of the corridor), protection or core areas (to maintain biodiversity repositories), combined with supportive capacity building, proposed policies, and institutions (for incentive and enforcement of protection measures) that would lead to the achievement of the project development objective.

29. To address the main drivers of biodiversity loss in the Atlantic Corridor, Project design agreed with Bank, the Government, ITAIPU, NGO, local experts and consulted groups was based on five pillars: (i) establishing the Mbaracayu–San Rafael Conservation Corridor within public and private lands through sustainable native forest management practices for biological connectivity; (ii) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation; (iii) strengthening the institutional capacity of the Ministry of Agriculture and Livestock (MAG) to implement conservation techniques in the rural landscape; (iv) improve SEAM knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of such activities; and (v) strengthening the National Protected Areas System.

30. *Participatory Processes.* Project preparation followed a highly participatory process. The participatory preparation process convened rounds of consultations with the participation of a wide range of stakeholders including government institutions, NGOs, local experts and local groups with a specific interest in the region, including representatives from at least 10 governmental and non-governmental organizations with a stake in biodiversity conservation.

31. *Assessment of risks.* Risks were relatively well identified at appraisal, including the substantial risk rating for the inter-institutional partnership of the project with the SEAM and potential issues in disbursement of the MAG co-financing. The risk regarding Community

[6] Paraguay Wildlands Project (UNDP–GEF full-size project), *The Mbaracayú Biodiversity (GEF-*TF051577)

driven mechanism focused strongly on corruption risks that were rated as "high", but during implementation, there were no significant issues in this regard. To mitigate these risks, the Project defined a design that did not include cash transfers directly to beneficiaries but the establishment of agreements with local and regional agencies, cooperatives and NGOS which lead the implementation of subprojects together with the beneficiaries and promoted local ownership and pride among a broad range of stakeholders which was ruled by detailed agreements and definitions of institutional roles, responsibilities, and objectives. Under this institutional arrangement, the PIU oversighted more than 30 local regional agencies, managed activities related to the overall Project management, financial administration, monitoring and coordination with partners.

32. *Initial targets* of the project design for landscape conservation were high because the project expected to have a greater participation of large landowners that would allow greater landscape coverage from restoration activities. However, larger landowners were not interested in the project. Thus the expected size for a subproject was overestimated (150–250 ha expected per subproject) when small farmers have plots smaller than 20 ha, and 10 ha on average. The PAD had some inconsistencies in the number of beneficiaries in the landscape (2,500 in the text and 3,000 in the tables) and the number of watersheds to be the focus of planning activities (25 and 75 mentioned in different sections). However, this was worked on, and defined by, project management and technical staff during implementation and served as the basis for the July 1, 2014, restructuring. Component 2 indicators assumed that infrastructure and management plans were possible to develop in several national parks, but these parks lack proper environmental protection since these comprised of Indigenous and private properties (San Rafael and Ybytyruzu, in particular). During the restructuring of July 2014, these aspects of design were adjusted by the project team.

2.2 Implementation

33. Project implementation effectively began in July 2011 but it coincided with the beginning of political turmoil in Paraguay. The coalition government of President Lugo fell apart in 2012, resulting in his impeachment and removal, with his allied Liberal Party taking over the Presidency under Federico Franco. From 2011 to 2015 the institutional governance for the project was affected and included changes in administration in ITAIPU and the SEAM that were the key implementation institutions of the project. The Franco government was essentially transitional, and elections held in 2013 brought a new government (and another party) into power in August of 2013. The new authorities of ITAIPU installed a new team and the project started a more normal implementation, however at an operational level, there were difficulties in hiring key personnel given the limited local availability of specialists with the skills and experience required. Many of the best specialists had participated in the preparation phase and were hence not available to support implementation.

34. The new government in place in 2013 coincided with the MTR of the project which recommended changes in the governance structure and the restructuring of the project. Originally, two different governing bodies were created to support project oversight and technical advice. The Management Council was eliminated and only the Executive Working group chaired by ITAIPU, and the participation of SEAM, MAG and INDI remained as an advisory level mechanism meeting on a quarterly basis, designed to review implementation

issues and intra-institutional coordination. Micro-catchment planning was scaled down, since this is a labor-intensive process often taking many years to consolidate in a fully participatory manner. Private reserves also became less viable as the cost of commodities rose and the land boom also drove up opportunity costs for setting aside land for forest protection. Small producers were more interested in the project than large producers; therefore, the potential project coverage was reduced.

35. **From MTR to closing** the project rapidly took off as can be seen by the disbursement graph in section I of the ICR Datasheet of this ICR. The MTR outcomes provided a more stable institutional context for implementation and allowed the project to mobilize rapidly in the field, at least from the perspective of ITAIPU-driven activities. The PRODERS project under MAG that was partially blended with the project, had been disbursing in a sustained manner during the early years of the project (2011–2013), but the AF phase marked a period of low disbursement that persists to the present. Only 56% of the government counterpart funding from PRODERS was received, and the shortfall had to be covered by ITAIPU co-financing, Nevertheless, PRODERS' early implementation allowed landscape-level sustainable investments and watershed planning to lay the groundwork for later execution by the project with ITAIPU funds.

36. **Another key outcome of the MTR and subsequent restructuring was the greater integration of Indigenous Peoples participation**. Several projects prior to the Paraguay Biodiversity project had established platforms for integration of IP groups into conservation planning and project implementation. IPs voiced their concerns about traditional park planning and management approaches on their lands. Recognizing this legitimate concern and the need to build on this platform for effective implementation, the IP dialogue was strengthened and completely integrated in the case of San Rafael as the main focus of implementation in that protected area. INDI was also brought in as a project partner institution and received an important level of support from the project at the institutional level.

2.3 Monitoring and Evaluation (M&E) Design, Implementation, and Utilization

37. **Design.** The M&E framework was prepared in line with the landscape approach of the project and sought to integrate the GEF Tracking tools 1 and 2 in the M&E process. The adjustments made after MTR did not involve dropping any indicators rather the refinement of their targets as well as establishing a clearer interpretation of how they were to be understood. The M&E system recognized the limitations and risks on the institutional operational, governance aspects, and targets. The need to realign the indicators based on the relative levels of technical, operational, and financial implementation levels from startup to MTR is described in the PAD (Annex 3 Use of Results Monitoring). PDO indicators included application of GEF tracking tools 1 and 2 for alignment and comparison with global monitoring of impacts and served project level outcome monitoring needs as well. However, some indicators included in the PAD were not very clearly defined, requiring some adjustments and interpretation once the project started. Potentially better capacity-building indicators and a measure of economic development could have been included for broader coverage of the PDO which was ambitious and complex; however, those aspects were somewhat covered under the intermediate indicators and through measures of efficiency of the investments.

38. **Implementation.** The project adopted several M&E systems both for project management and for establishing and monitoring biological indicators within the area of project intervention**.** The project developed a project management system to improve planning and provide tracking, monitoring and information of all investments, beneficiaries and project indicators. Following the MTR, 28 indicators or their targets were revised at the PDO level and in all four components as described in section 1.6 Revised Components. The effects and effectiveness of the changes in targets were substantial, providing a clear roadmap for ITAIPU to leverage the resources it needed to achieve the proposed outcomes and outputs. Biodiversity monitoring included the establishment of biodiversity baselines for selected sites representative of the Corridor and improvement of the information management of the National Biological Inventory, the primary public biodiversity information system.[7] Data collected included: richness, number of individual per specie, presence/absence of endangered species, among others. In April 2016, with support from the project, ITAIPU signed a cooperative agreement with the Smithsonian Institution Center for Conservation and Sustainability to advance initiatives in monitoring and conservation of biodiversity, improving the information database and quality of the information on biodiversity in the Corridor.

39. **Use.** The project monitoring systems were quite comprehensive and included (a) monthly or biweekly visits of at least two groups of a four-layer system composed of (i) technical experts from the Central PIU (component coordinators, Subprojects' coordinators, IP coordinator, and assistants- about 15); (ii) technical experts from regional offices (5); (iii) experts from the IICA team (15); and (iv) local co-implementing agencies (30 agencies). The project monitoring systems also included: (b) six monthly visits from the team of the concurrent technical audit (6) whose reporting included site visits; (c) project-financed biodiversity monitoring surveys by national biodiversity experts at a sample of project sites, and ITAIPU financed periodic biodiversity monitoring of all six of its reserves; and (d) the project also financed a Biodiversity Database Management tool tailor-made for SEAM. Both the ITAPU and the SEAM systems continue in use. Reports on the ITAIPU monitoring are available on the integrated data project management system.

40. **Access of information:** The project also developed a web portal to provide information publically to national and international audiences. This website has garnered over 34,500 visits since 2013 and can be viewed at http://www.paraguaybio.com.py/. Social media was also used effectively; this includes a dedicated Facebook page that currently has over 8,500 followers. The page is available at
https://www.facebook.com/Paraguay-Biodiversidad-1528526954041746/

41. **GEF tracking tools**: The project design involved GEF strategic priorities in protected area strengthening and mainstreaming biodiversity into the productive landscape. The two

[7] http://www.seam.gov.py/servicios/museo/divisiones.

http://www.paraguaybio.com.py/monitoreo-biologico.html

tracking tools were completed at MTR (October 2013), and end-of-project (April 2016). Tracking tool 1 was applied to the four protected areas of focus for the project including Ybytyruzú, Caazapá, San Rafael and Ñacunday protected areas. The areas all indicated high levels of threats with all park presenting over 65% of threats possible. Management effectiveness scores were very low with a score of only 15 for San Rafael National Park at baseline.

Table 1. Results of the GEF Tracking Tool 1 – Baseline

Protected Area (PA)	Threats	Score
RRM Ybytyruzú	73 (67.6%)	37 (37.4%)
PN Caazapá	74 (66.7%)	52 (51%)
ARPN San Rafael	80 (76.9%)	15 (17.8%)
PN Ñacunday	75 (75.8%)	34 (36.6%)

42. Following implementation, the numbers rose for all PAs in terms of management effectiveness, although the threats were maintained and even increased in the case of Ybytyruzu, where mining emerged as a threat during the planning exercises. These increases were all due to strengthening activities supported primarily by the project including land titling in San Rafael, management planning, IP dialogue, and PA infrastructure.

Table 2. Results of the GEF Tracking Tool 1 - End of project

Protected Area (PA)	Threats	Var.	Score	Var. (2013–16)
RRM Ybytyruzú	78 (72.2%)	+5	66 (66.7%)	+29
PN Caazapá	74 (66.7%)	0	52 (51%)	0
ARPN San Rafael	80 (72.1%)	0	51 (50%)	+36
PN Ñacunday	75 (75.8%)	0	65 (70%)	+31

43. Tracking tool 2 showed an increase given a baseline of 122,900 ha at entry the final landscape covered was 311,735 for an increase of 188,835 ha of increased mainstreaming of biodiversity. Two sector policies were advanced, as well as voluntary measures for forest restoration on behalf of Yguazú Cooperative.

2.4 Safeguard and Fiduciary Compliance

44. **Environmental Safeguards.** The project was classified with a category "B" rating for environmental and social safeguards. Safeguards were consistently supervised by experienced safeguards specialists and rated satisfactory throughout implementation. The project complied with national legislation and received the environmental licenses for the small-scale subproject investments and SEAM infrastructure development financed by ITAIPU. The environmental safeguards issues given most attention included the pest management (OP 4.09) aspects related to the restoration activities. The attacks of leaf-cutter ants in the forest restoration activities proved to be most challenging. The project prepared an update of the pest management plan that incorporated traditional and indigenous methods utilizing organic control technology[8].

[8] Paraguay Bio Project site: http://www.paraguaybio.com.py/institucional_doc_oficiales.html

45. **Social Safeguards.** The project triggered the World Bank social safeguards OP 4.10 (Indigenous Peoples). Given that the environmental and social impacts were expected to be positive as a GEF project, focus on safeguards was primarily centered on the social and participation aspects to ensure the appropriate implementation of the Indigenous Peoples policy through an Indigenous Peoples Planning Framework (IPPF, *Estrategia Indígena* in Spanish) prepared for the project. The IPPF was advanced substantially more than considered in the strategy. Through project implementation the rating of this policy was Satisfactory and at the last ISR, it was upgraded to Highly Satisfactory (HS).

46. Of the 92 indigenous communities living in the Corridor, the project reached 55 communities and four ethnic groups: Aché, Avá Guarani, Mbyá Guarani, and Pai Tavyterā. 2,283 families, representing some 10,636 people on 67,705 ha of land, who benefited from the project. A total of 296 subprojects were funded and implemented by indigenous communities living throughout the Project Corridor's five Ache communities, 23 Ava communities, 26 Mbya communities, and one Pai Tavytera community. Broad community support was obtained and documented for the preparation of the productive and restoration subprojects. This included and important level of participation by women and youth, as corroborated by the beneficiary and local implementing agencies surveys (Annex 5). The project unit of the Paraguay Bio Project had a dedicated specialist with experience working with IP and with knowledge of Guarani language spoken by the Eastern Paraguay groups.

47. **Financial Management (FM).** FM was rated Moderately Satisfactory throughout the implementation period. The project showed adequate FM arrangements that complied with Bank requirements. The grant was initially implemented at a very slow pace. At the beginning, there was high FM staff turnover and vacancies took a long time to be filled. This was because the project would be implemented with a core group of consultants in a project-management unit that would prepare for third-party/outsourced implementation of the subprojects and all component activities. However, at the MTR, it was decided that key managerial positions would be covered by ITAIPU and other technical positions maintained by consultants. There were delays in contracting the external concurrent technical-financial audit firm.

48. The Final Project Audit Report as of July 31, 2016, was received by the Bank on November 17, 2016. Audit reports were reviewed by the Bank and found acceptable. The Concurrent Audit financed by the project contributed to maintaining an appropriate fiduciary control environment throughout implementation of subprojects under Component I. The Concurrent Audit reports and Interim Financial Reports were presented to the Bank regularly, but with some delays; reviewed and found acceptable. FM monitoring was regularly conducted during supervision missions. While FM support was provided as needed, FM capacity building activities were provided throughout the operation's lifetime. The project closed on April 10, 2016. The grace period was extended by one month to September 10, 2016. The project was fully disbursed and documented.

49. **Procurement.** For the life of the project, procurement performance was rated Moderately Satisfactory (MS). No major issues arose, although the risk rating was considered high from the beginning. The PIU appointed a full-time procurement specialist that received training from the World Bank procurement specialist. Consistent with the design of the project, most of funds were invested in Community Driven Development (CDD) projects, whose

purchases were made by the local implementing agencies (*Ejecutoras*) which control the delivery of goods to the beneficiaries. The concurrent audit concluded that procurement processes in them were executed under the estimated cost and in accordance with the corresponding Procurement Plan. A limited number of processes were carried out by the PIU that were managed in an acceptable manner, although with significant delays since several processes failed due to the few firms present in the country in specialized environmental matters. The need for consultants to know the Guarani culture and language made the application of the procurement norms very challenging for the PIU staff.

2.5 Post-Completion Operation/Next Phase

50. The project has set in motion many substantial efforts described below that are expected to have continuity in the short and medium term while others lay the basis for longer-term change at a more structural level.

51. **ITAIPU.** The project has been integrated as a mainstream program of Itaipu Binational (IB) and continues to support IP communities and producers helped by the project with additional technical assistance to ensure the sustainability of the productive investments. It has advanced a landscape and conservation corridor approach to its reforestation (Preserva program) and watershed protection programs. At an institutional level, the Board of Directors of IB has approved a sustainability framework and linked to the overall Coordination Directorate, making possible the incorporation of the Paraguay Bio project—scope, objectives, and operational structure—into the IB programs. IB is committed to continue giving sustainability to the activities and achievements of the Paraguay Biodiversity Project and has signed a Reimbursable Advisory Services (RAS) agreement with the World Bank valued at US$850,000 to continue its work in the consolidation and restoration of the Corridor. This will also leverage additional funds from the Program on Forests (PROFOR) and other trust-funded sources for furthering sustainability initiatives that began with the project.

52. The SEAM/UNDP-GEF Green Commodities project continues coordinating with IB through exchanges, provision of information, and technical cooperation in districts within the ITAIPU watershed. INDI did not incorporate the staff hired by the project and only one technician of the original team supported remains in place. Nevertheless, IB continues working closely with the authorities of INDI. It is expected that the MAG–PRODERS project continues through the end of 2017 and it will advance several of the sustainable models piloted with the project. This experience developed in the Corridor in forest restoration and small-holder agro-forestry/plantation has contributed to the design of a US$120 million proposal being prepared for submission to the Green Climate Fund (GCF) for Paraguay.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design, and Implementation

Relevance of Objectives

Original Project

53. **Relevance of Objectives.** The project objective was to assist the Member Country's continued efforts to achieve sustainable natural resource-based economic development in the Project Area, by: (a) establishing the Mbaracayú–San Rafael Conservation Corridor within public and private lands through sustainable native forest management practices for biological connectivity, (b) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, (c) strengthening the institutional capacity of MAG, (d) strengthening the institutional capacity of SEAM to improve knowledge regarding forest and biodiversity conservation, and (e) strengthening the SINASIP (PAD, page 6). This sustainable natural resource-based economic development in the Project Area that the GEO/PDO proposed, would be achieved when these five pillars were accomplished by the project results.

54. When the project was being appraised, the Atlantic Forest was a critical hotpot of global concern[9] and the government was making efforts to reduce the deforestation and implementing its National Biodiversity Action Plan which was targeting greater investments for forest protection, development of protected areas management plans, reforestation, community participation (including Indigenous communities), sustainable land management, among others. That is why the project included many of these areas in its objective and design. For ITAIPU, the objective of the project was very relevant because, since the 1980s, ITAIPU has worked toward conservation of the Upper Paraná Atlantic Forest. ITAIPU is interested in reducing siltation affecting the reservoir that supplies water to its generators. It had secured a core of protected areas, supported the conservation of endangered species, and has strong collaboration with local stakeholders through the royalties and existing programs of education, health, and water in the Upper Paraná that it supports.

55. The project was consistent with the World Bank Group's Country Partnership Strategy (CPS) for Paraguay (2009–2013) (Report No. 48087-PY) connecting with all three CPS pillars, especially with the third pillar goal of "supporting sustainable growth and environment" by helping farmers improve farming practices in an environmentally sustainable manner. It also connects with the second and first pillars by supporting and increasing social inclusion and strong participation in the project of Eastern Paraguay's poorest rural areas. The project intended to support conservation of forested land and increasing connectivity of protected areas in an agriculture landscape by creating a conservation corridor as the main territorial framework to conduct sustainable management, encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes; increasing participation of private land owners in the conservation of forest lands; and supporting SEAM's capacity building, including development of policy proposals and management instruments for increasing conservation, and construction of infrastructure for protected areas. The relevance of objectives of the original project is rated as **High**.

[9]According to WWF and other international conservation organizations, the Atlantic Forest is currently one of the "…places at imminent risk of large-scale deforestation…."
http://www.worldwildlife.org/publications/living-forests-report-chapter-5-saving-forests-at-riskpage 2.

56. **Relevance of Design and implementation.** The design of this project was triggered by the GoP's interest to address improvement of biodiversity conservation and connectivity of the Atlantic Forest remnants to complement the results of the Zero Deforestation Law (2004) which was reducing deforestation but few efforts existed in the country to restore degraded land or improving genetic connectivity between protected areas (as ITAIPU programs). The project also responded to the GEF Biodiversity Conservation Focal Area [10] priorities of conserving globally significant biodiversity (such as the Atlantic Forest) and promoting maintenance of ecosystem goods and services provision through a focus on protected areas and biodiversity within the productive landscape.

57. The project effectiveness was delayed by more than a year because of political issues that affected the country, unclear relations among implementing agencies and shortcomings in applying bank procurement methods. Close supervision allowed the Bank to provide the needed support that helped to turn around the project in the third year after the project approval, and to address progressively fiduciary, M&E and safeguards application. The objectives were highly relevant however because of this very slow and weak startup, the design, and implementation in this phase of the project is rated **Modest.**

Revised project

58. **Relevance of Objectives.** The project went through a first level restructuring in 2013, which consisted of: i) the change of institutional arrangements for the management council prompted by political differences with SEAM that affected project implementation. The key lessons learned from the original project were incorporated in the subsequent project restructurings toward improving the project indicators. This was done to adjust to the reality of land costs due to the rapid commodities boom[11] in the Atlantic region. The restructurings took account the changing needs and interest of new government officials, so that the operation remained important to achieving the country's, Bank's, and GEF's objectives, increasing sustainability of investments, and supporting local capacity-building efforts to create a large network of regional implementing agencies. Second, for ensuring social inclusion and ample participation of IP, INDI was incorporated in the Management Council and a revised IP strategy was incorporated across all components, and investments in IP areas helped to maximize development impacts.

59. Adjusting the project scope was in harmony with the 2015–2018 Paraguay Country Partnerships Strategy (CPS) prepared in 2014, specifically as related to the target to support

[10] GEF Focal Area. Evaluation of the GEF Focal Area Strategies. (1) SP-4: Strengthening the policy and regulatory framework for mainstreaming biodiversity; (2) SP-3: Strengthening terrestrial PA networks; (3) the Land Degradation Focal Area Strategic Priority 2: Supporting Sustainable Forest Management in Production Landscapes; and (4) Sustainable Forest Management Strategic Objective 2: To promote sustainable management and use of forest resources. https://www.gefieo.org/sites/default/files/ieo/council-documents/c-43-me-inf-01.pdf

[11] The prices of land changed rapidly, reaching prices of more than US $10,000 dollars per hectare, causing the cutting of forest for planting soy and other products.

18% i*mproved forest management and conservation practices in the Upper Paraná Atlantic Forest area by 2018.* The project has contributed in the full achievement of this CPS indicator and the project is currently relevant to recently approved **WB Forest Action Plan, 2016–2020** in its targets of support improve forest governance, restoration, local livelihoods and protection. The project objectives and design also continues to be relevant to GEF current global and regional biodiversity agendas.[12]

60. The project continues to be relevant to the GoP, as shown by the following: The GoP (i) issued a Declaration of National Importance on the corridor restoration efforts promoted by this project (Mbaracayú–San Rafael); (ii) launched the preparation of the new Biodiversity Strategy in which several actions aim to promote restoration of the UPAF and improved forest management; (iii) developed a Country National Development Plan 2030, which includes forestry targets[13] to promote the sustainable management of forest ecosystems and support reforestation activities in the Atlantic region; and (iv) recently issued Decree 3050 (2015) to impose the use of certified fuel wood requirements on the agroindustry.

61. For ITAIPU, the project is also highly relevant since it has launched the largest and ambitious forest restoration plan in the country with native species (investing about US$11 million), the GEF project has transformed into a mainstreamed Program in the Environment Department of the IB. A programmatic RAS has recently been signed with the Bank to continue working in the conservation of the Atlantic Forest, biodiversity and local development (P161498). The relevance of objectives of the revised project is hence rated as **High**.

62. **Relevance of Design and Implementation.** The design of the project, its components, and activities were consistent with the project objectives, the strategy to promote a corridor as a model of environmental sustainability for the remnants of UPAF and a participatory approach to include local communities, farmers, private sector, and NGOS in the effort of promoting better land-use practices and forest conservation in the project area.

63. Key principles underpinning the project design were (i) supporting connectivity for protected areas, landscape, and forestlands within a proposed conservation corridor; (ii) supporting community-demand-driven subprojects to further sustain the main conduit of social participation and generation of benefits; (iii) maximizing institutional-sectoral synergies in the natural resources sector (ITAIPU, SEAM, and MAG) for development impact; (iv) scaling up access for the rural poor for technical support, high quality training, supplies, and goods; and, finally, (v) building a strong local/regional organizational partnership to lead implementation of subprojects.

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[12] GEF- Biodiversity Strategy, 2014-2018. https://www.thegef.org/sites/default/files/publications/GEF-6-BD-strategy.pdf
GEF. 2016. *Biodiversity Mainstreaming In Practice: A Review of GEF Experience.* https://www.thegef.org/sites/default/files/publications/GEF_MainstreamingBiod_11.28.16.pdf

[13]*Paraguay 2030 – Plan Nacional de Desarrollo*) which includes a strategic objective (3.4) "Sustainability of Global Habitat" for the "Restoration of at least 20% of degraded ecosystems."

64. There was a logical chain between the components, outputs, outcomes, and objectives of the project. For instance: (a) To improve sustainable native forest management practices for biological connectivity, about 50% of the GEF resources were allocated to community subprojects to increase forest conservation and management, and increase connectivity. (b) To strengthen the SINASIP, infrastructure, management plans, purchase of vehicles for patrolling, awareness campaigns were financed. (c) To encourage sustainable agricultural practices, more than 100 training courses were given to individual farmers, farmers associations, and cooperatives, staff from the Ministry of Agriculture and PRODERS to ensure inclusion and participation of forest-dependent communities and 55 indigenous communities. To ensure the sustainability of the project's results, ITAIPU incorporated the project as a program of the Environment Department, thereby ensuring long-term funding activities to consolidate the corridor model and strengthen local technical and institutional capacity. In addition, the Steering Committee established by the project has continued providing a coordination platform among SEAM, ITAIPU, MAG, and INDI for further consolidation and for improving land-use efforts in the corridor.

65. Two exogenous factors that influenced the project were (i) that counterpart funding from PRODERS was not fully achieved, because of political issues affecting MAG that slowed project implementation; and (ii) the commodities boom in the Oriental region increased land costs significantly and very rapidly, which increased the opportunity cost of land and made it necessary to adjust several targets in the results framework.

66. Regarding implementation, the project effectiveness was delayed by more than a year because of political issues that affected the country, unclear relations among implementing agencies and shortcomings in applying Bank's procurement methods. Close Bank supervision and support helped to turn around the project in the third year after the project approval, and to address progressively fiduciary, M&E and safeguards application. The project went through three level-2 restructurings. The first restructuring allowed for changes in the Executive Working Group, the second to extend the closing date of the project, and the third to revise project performance indicators. Notable features of the relevance of project implementation include the following: (i) despite start-up difficulties, the Bank and IB were proactive and resilient by addressing roadblocks and supporting the consolidation of local capacity for project implementation, and (ii) the PIU has strengthened its technical capacity over time, to the extent of reaching high-level standards of project implementation and performance. Project implementation remained relevant since the restructured targets were still of a significant size in the landscape and important from a global biodiversity standpoint while generating institutional capacities in key priority areas linked to the PDO. The relevance of the design and implementation of the original project and the revised project are rated **Substantial.**

3.2 Achievement of Global Environmental Objectives

67. The GEO/PDO proposed that the natural-resource-based economic development of the area in the proposed corridor of public and private lands, incorporated sustainable land use practices by the implementation of subprojects, supported the strengthening of capacities of SEAM and MAG and supported the strengthening of the National Protected Areas System; therefore, the achievement of the GEO/PDO would be achieved when these five pillars were

accomplished during project implementation. Since project results showed a distinct difference between two periods, a split evaluation has been applied to assess the achievement of the GEO. The restructuring of July 2014 revised the key indicators and targets linked to both outcomes and outputs, also the institutional architecture of the project was improved, generating a contrast in both implementation effectiveness and related project disbursements.

Original project (2011–2014. 16% of grant amount disbursed)

68. The efficacy is rated as **Modest**. The project achievements were primarily related to the productive outcomes (a) and (b) that were supported by the semi-blended PRODERS project. Institutional strengthening outcomes were advanced and laid the platform for a rapid implementation once the institutional arrangements were later revised and improved. Protected areas initiatives, especially related to San Rafael progressed in terms of the categorization of the area and the role of IP, leading to significant adjustments in the arrangements for their involvement in the restructured phase.

Restructured project (2014–2016. 84% of grant amount disbursed)

69. The efficacy following restructuring is rated as **High**. The objectives have been fully achieved as demonstrated by the project having reached the stated (restructured) targets established for the outcomes and having fully disbursed. The sustainable natural-resource-based economic development in the PDO is achieved because the five pillars describing the GEO/PDO were achieved by the official creation of the Corridor connecting public and private lands, sustainable land use practices were incorporated in the implementation of subprojects which lead to increased revenue to beneficiaries, supported capacities of SEAM and MAG and farmers by providing training and equipment, supported the strengthening of the National Protected Areas with the construction of infrastructure, preparation of management plans and monitoring of biodiversity. A detail causal chain is presented in Annex 10. The following is a summary of the efficacy by outcome.

70. **Outcomes (a) Mbaracayú-San Rafael conservation corridor within public and private lands through sustainable native forest management for biological connectivity, and (b) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation.** Corridor connectivity is significantly expanded with an increment of 67,619 ha under better management and protection, achieving 233,353 ha of Corridor under conservation. Restoration investments achieved 36,254 ha of biodiversity-friendly productive activities laying the groundwork and models for a more sustainable production with small farmers. A host of models was advanced and models with shorter-term return that provide both income and food—such as agro-forestry models with citrus, yerba mate tea, and honey—also showed positive IRR's. Watershed planning in 20 micro-basins advanced sustainable landscape planning ensuring the project covered the range of interventions necessary to establish conservation corridors spanning individual productive agricultural plots to the higher-level basin and corridor plans. Achievement of these outcomes is rated **High.**

71. **Outcomes (c) strengthening the institutional capacity of MAG to implement conservation techniques in the rural landscape, and (d) strengthening the institutional**

capacity of SEAM to improve knowledge on forest and biodiversity conservation activities, including monitoring and enforcement of said activities. Investments were made to strengthen MAG and SEAM capacities in landscape, productive, and conservation policies and programs. While the MAG has good capacity in agriculture and rural productivity issues, it did not have a significant record of working in landscape themes such as restoration, sustainable forestry, and non-timber forest products, which was achieved with the project. The project provided specialized training to PRODERS staff and beneficiaries (farmers and indigenous communities), field technicians and helped establish protocols for forestry and pest management control that continue to be applied in MAG forestry projects with small farmers. SEAM investments achieved a substantial advance in the conservation policies and regulations of the country as its key institutional outcome with long-term projection. Among these, an environmental fund was developed, and methodology and criteria for valuing environmental damage from deforestation and related environmental crimes were established. A management plan for Ybyturuzu Managed Resources Reserve was prepared through a large consultative process. New infrastructure was built to benefit the conservation and safeguarding of protected areas (for example, Ñacunday and Caazapá), and to improve government capacities for governance and protection of the SINASIP (through the construction of a two-story building for the National Directorate of Protected areas in SEAM). Achievement of these outcomes is rated **High.**

72. **Outcome (e) Strengthening the National Protected Areas System**: The approach to this objective on integrated public and private protection efforts, since such integration is necessary for a landscape and corridor approach to be effective. Efforts on the public side included establishing title to pubic areas and management plans that integrated communities, especially IP. Most significant in terms of the National Protected Areas national protected areas system was the establishment of a core public area of 500 ha for San Rafael National Park, a site of global biodiversity importance. This outcome is the culmination of over 20 years of national and international conservation efforts including previous UNDP–GEF investments. San Rafael is also one of the few protected areas in the system with a formal title (supported by the project), which is possessed by the GoP, to ensure its tenure and protection and providing a basis for managing the broader protected area. This is significant, given SEAM prior to the project did not own any land within the San Rafael protected area. In addition, four new private protected areas provide core conservation areas within the Corridor and increase significantly the coverage of the protected areas system by 23,619 ha. Levels of protection increased in all areas supported by the project as demonstrated by the improved GEF tracking tool 1 monitoring. The threats, also measured by the tracking-tool, increased over the project implementation period making these advances in protection even more significant. Achievement of this outcome is rated **Substantial.**

3.3 Efficiency

73. **The cost-benefit analysis shows that the project is generating large economic returns even under conservative assumptions and throughout different scenarios (see Table 3 below and Annex 3 for details).** This analysis contrasts the actual costs with economic benefits for the first 15 years, both discounted to 2013 (the baseline year). The benefits originate from establishing a conservation corridor through sustainable native forest management practices on 103,873 ha, encouraging sustainable agricultural practices on

125,015 ha, and strengthening the SINASIP on 169,620 ha. Benefits are assumed to be generated from carbon sequestration, watershed protection, bioprospecting, sustainable timber harvest, and existence value benefits from the respective areas. Costs are a combination of the actual financial costs of the projects from all counterparts—US$ 18.6 million—and the opportunity cost of land.

74. **The Net Present Value is estimated to be US$ 1.1 billion, and the Benefit Cost Ratio is 6.49, with carbon storage being by far the most highly valued ecosystem service.** The result's robustness is verified through different sensitivity analysis. Different discount rates (5%, 10%, and 20%); a reduction of the economic benefits by 20% and 50%; and an increase of opportunity costs by 500% are applied. The benefits are much larger than the costs throughout almost all scenarios, even though this analysis did not include all benefits, for example from recreational activities. In reality the project benefits might be far greater, as this analysis disregards benefits from new policies, monitoring tools, capacity building or guidelines which are all likely to have triggered in the past—or will trigger in the future—further positive developments of sustainable resource management. Based on these substantial benefits, efficiency of the restructured project is rated **High**. In addition, this analysis supports the GEO outcome regarding advancing the country efforts on sustainable natural resource based economic development. The literature indicates that the environmental degradation in Paraguay reduces its Gross National Income (GNI). Net forest depletion is 5.3% of GNI per the 2016 Little Green Book of the World Bank as compared to the average for the Latin America and Caribbean Region of 0.3%. The efforts of this project reduce (albeit by a small percentage), that loss with its improvements in forest cover in addition to the other benefits accrued in climate mitigation, resilience, and direct income from productive investments.

Table 3. Results of Cost-Benefit Analysis between 2008 and 2023

	Baseline		***Baseline (-20%)***		***Baseline (-50%)***	
	NPV	BC-Ratio	NPV	BC-Ratio	NPV	BC-Ratio
Discount Rate 5%	1,095,647,355	6.49	836,637,731	5.20	318,618,484	2.60
Discount Rate 10%	771,055,107	6.34	587,987,212	5.08	221,851,421	2.54
Discount Rate 20%	435,565,667	6.04	331,182,642	4.84	122,416,592	2.42

Note: NPV = Net Present Value; BC-Ratio = Benefit Cost Ratio

75. Rates of return were also considered for the productive small-producer sustainable investments supported as part of corridor establishment. A group of 32 subprojects was reviewed by IB at end-of-project to consider their estimated Internal Rate of Return (IRR). The subprojects were from the native forest restoration and regeneration (type II) and "socio-productive" (type III) models of subproject. In the case of the Type III models, a high level of plant survival was noted for yerba mate plantations (85.7%). IRR levels are 52% for small holders, 17% for medium and large-scale producers against a baseline for productive activities estimated in the PAD of 50%, 14%, and 14%, respectively. It should be noted that these estimates are based on projections, since the agro-forestry projects supported will only generate income in the fifth year after planting (2020).

76. The private and public protected areas established and strengthened under the project have immense value beyond their globally important biodiversity. Land values in the UPAF region can average $2,000–5,000 and beyond depending on productivity. Large landowners have significant lost opportunity costs from forgoing mechanized agriculture or ranching. Considering also the environmental services provided, the value of these private conservation commitments is in the tens of millions of dollars. These reserves provide substantial additionality to the protected areas system given the very low compliance overall of landowners in maintaining their legal reserves presently. Potentially, landowners will receive future payments for environmental services certificates that the project has helped to advance. Based on these substantial benefits and rates of return efficiency of the restructured project is rated as **High**.

77. The efficiency of the initial phase of the project is rated as **Low** based on the long period this represents in the project timeline with its associated disbursements largely represented by operating costs for maintaining the project and preparing the technical and institutional basis for the implementation.

3.4 Justification of Overall Outcome Rating
Overall Rating: Satisfactory

Original project

78. The relevance of objectives was high and remained so throughout project implementation, including the revised project stage. The relevance of the design was substantial, efficacy was modest, and efficiency low. The combination of these factors results in an Unsatisfactory overall rating for this phase of the project, also consistent with the average ratings of the GEO performance in the ISRs in this period.

Revised project

79. **Relevance of Objectives: High.** The PDO reflected a well-diagnosed set of priorities aligned to past and current Bank, GEF, GoP and ITAIPU strategies.

80. **Relevance of Design: Substantial**. Although the design included some challenging aspects, at the end, it included essential pillars for reaching the project results and objectives; the leading role of ITAIPU, the participation of SEAM, MAG and INDI, and reachable targets for the mix of activities combining the protection of biodiversity, conservation areas, improvement on land-use practices, awareness raising campaigns and advocacy for new regulations and policies.

81. **Efficacy: Substantial**. Four outcomes were rated ‘High’ and one ‘Substantial’. The project’s achieved results exceeded expectations in most of its indicators and have made a meaningful contribution to the project’s development objectives in the critically threatened Upper Paraná Atlantic Forest (UPAF) ecosystem.

82. **Efficiency: High.** The project closed with a full level of physical and financial execution. The results of the cost and benefits analysis confirmed the positive returns that the project achieved with a grant of only US$4.5 million. This represents just 24% of the overall project cost, which leverage, direct investment made by ITAIPU, the GoP, and the

beneficiaries. In addition, the project's lifespan had to be extended only 36 percent compared to the implementation period originally planned. The design and delivery mechanism have largely proven to be appropriate to achieve the project's results.

Weighted outcome rating

83. At the time of restructuring, only US$0.70 million, or 15.8 percent, was disbursed out of a total grant amount of US$4.5 million. The outcome of the original objectives was rated unsatisfactory, while the outcome of the revised objectives was rated satisfactory, which on a scale of 1 to 6 is assigned a rating of 2 and 5, respectively.
0.16x216x 2 + 0.84 x 5= 0.3232 + 4.21 = 4.5252, which rounds up to 5.

The weighted outcome rating is **Satisfactory**.

3.5 Overarching Themes, Other Outcomes, and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

84. The project targeted the most impoverished sector of the Paraguayan population, its rural small-scale farmers and IP. The subprojects were executed in departments of extreme poverty (Caazapá and Caaguazú), equivalent to 66% of the total investments made. The remaining 34% were executed in the departments of Canindeyu, Alto Paraná, Itapúa and Guairá which are also poor, according to the Social Assessments prepared for the project as well as the census data and poverty data of the Secretary of Social Welfare (STP 2016). Around 20% of the total IP population of Eastern Paraguay participated in the project through their community sustainable production subprojects. This percentage represents over 10,000 people from the segment of the Paraguayan population considered in extreme poverty that that were supported through 291 community subprojects. The majority of the beneficiaries from the subprojects (about 80%) were small farmers (owning less than 20 ha) and IP. The project benefited 23% of women and 77% men.

(b) Institutional Change/Strengthening

85. ITAIPU: The results of the project have positioned ITAIPU as a leading agency in restoration. NGOs, forest owners, and other organizations are seeking ITAIPU to collaborate in the next phase of the Paraguay Bio. ITAIPU has incorporated the project as a program in the corporate administrative structure, thereby ensuring a team and an operational budget. The GEF-funded project transformed the entity's work out of the margins of the reservoir into its watershed and in the Paraguay and Lower Paraná drainage area. The project has also strengthened its position to work with IP, agricultural sector and in landscape restoration. At the international level, the results of the project have motivated ITAIPU to adhere to the 20x20 Initiative[14] to upscale the restoration results of the Paraguay Bio of the Atlantic Forest and to improve the biodiversity monitoring tools by signing an agreement with the Smithsonian Institution.

[14] http://www.wri.org/our-work/project/initiative-20x20

86. SEAM has expressed full support for the corridor as a new approach to this region's forest management. There is also interest that the environmental fund proposal prepared by the project could expand it so the fund can include fees, tariffs, and other economic sources from other legislation. SEAM has improved its operational capacities with the new building built for protected areas and the park ranger's facilities built in two Parks and the transfer of two 4x4 vehicles. SEAM is coordinating now more closely with ITAIPU on areas of common interest in the corridor such as conservation of protected species, climate change and restoration as part of the 20x20 Initiative.

87. MAG/PRODERS will be using the scope and methods developed by the project for training of their beneficiaries in promoting integrated pest management; the project also has the intention to work in the corridor area and support further investments on NRM and best agricultural practices following these GEF results.

Other Unintended Outcomes and Impacts

88. The project included INDI in the Executive Working Group and the institutional strengthening plan; consequently, INDI was also strengthened in the implementation of NRM activities with the IP that live in remote areas and as a channel to communicate with this population, assist in food security, ensure participation and benefits for the IP which is often excluded and marginalized. INDI also benefit from technical training (land rights, legal, agroforestry, among others), construction (an enviro-social unit was built with ITAIPU counterpart funding), equipment (offices equipment, a 4x4 vehicle), communication (publications on IP vision and culture) and national exposure (internet, media, Forum). After closing, its personnel continue participating in the field work, training, and coordinating with the Paraguay Bio in the best ways to ensure participation of Indigenous people in the consolidation of this Corridor.

89. Indigenous peoples received significant financing through 291 subprojects carried out with 55 indigenous communities. These are among the most impoverished members of Paraguayan society, but also the collective holders of the largest portions of the remaining forests of Paraguay, outside of the public and private protected areas systems. Even the project was not designed to have an IP 'component', the project applied the IP Strategy through all project components, making the proportion of subprojects allocated to the communities exceed the original estimates substantially. This provided a triple-win scenario for its positive results on biodiversity, maintenance of traditional systems of production, and improving income generation and food security for Indigenous communities.

90. The project also supported the strengthening of 30 local NGOs, associations, cooperatives that serve as regional implementing agencies in areas of: environmental management, biodiversity conservation, agroforestry, financial and accounting management, communication, and project management.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

91. A survey was carried out with 100 beneficiaries (from six different departments within the target area) to consider their views on the outcomes. The survey included women and representatives of IP. Notable findings of the survey show that 37% of the participants heard of the project through their local governments, cooperatives and local level entities, while another 63% were contacted by the technical assistance providers. This means that both outreach strategies have been effective. More than 60% of those surveyed, view the project and communication favorably. Eighty-six percent also rated the technical assistance as satisfactory or highly satisfactory, while 100% of those surveyed indicated that they felt the project was supportive of the restoration of the Upper Parana Atlantic Forest and biodiversity. The most prevalent comments indicated this is a slow process that will generate long-term benefits while deforestation continues to be a regional challenge. Another point highlighted regarding the sustainability of the investments was that over 97% of participants indicated that technical assistance was key to sustain investments along with ongoing training and replanting saplings that were lost.

4. Assessment of Risk to Development Outcome
Rating: Moderate

92. **Sustainable Production and Restoration Investments:** These investments have the lowest risk in terms of development outcomes of the project. While pressures will continue in the remaining forests of Eastern Paraguay, the expansion of Paraguayan mechanized agriculture has essentially reached a productive plateau with most of the best agricultural soils under production, and the less productive ones dedicated to grazing. The productive sector and the GoP concurrently (with pressure from civil society, NGOs, and the international community) have come to an increasing recognition that restoration must begin, as a need to comply with environmental legislation and compete in demanding international markets. The ITAIPU Paraguay Bio program has continued to monitor all investments made during the project, replace seedlings, continue the signing of agreements with the regional co-implementing agencies, investing US$11 million in forest restoration (Preserva program) and will prepare a strategy for the medium and long term engagement to consolidate the Corridor with the support from the Bank (P161498).

93. **Protected Areas:** These are the investments with the most risk for long-term sustainability of GEF investments. The SEAM Protected Areas Directorship is perennially underfunded and Paraguay has one of the lowest investment levels per hectare in the LAC region, with an annual budget of only US$ 20,000/year (SEAM 2016) to protect all declared protected areas. Successive projects have invested in protected areas infrastructure but these have not been appropriately staffed and sustained over time. While the investments in protected areas face challenges, this component has also invested in the core SEAM capacities providing a more adequate environment for supporting the protected areas system. The process in San Rafael established with Indigenous Groups and the SEAM, among other stakeholders in the region, could falter. However, the process most likely will be sustained with the continued support it has received from donors and the NGO community, including strong, locally based ones.

94. **Institutional Strengthening:** The aspects advanced by the project in policy, infrastructure, and training were significant for SEAM, MAG and INDI institutions and several

others involved in management and enforcement of natural resources conservation legislation (INFONA, *Ministerio Público*, Municipalities). Not only has SEAM supported with infrastructure, equipment and training, but also they have been supported with 7 proposals and studies to improve policy making, enforcement and valuing environmental damage in Eastern Paraguay. The establishment of infrastructure in some of the key parks such as Ñacunday and Caazapá will provide an improved conservation platform of core areas in this region of Paraguay.

5. Assessment of Bank and Borrower Performance

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry
Rating: Moderately Satisfactory

95. Preparation was characterized by a long process (2005-2010), after the concept in 2005, political issues in Paraguay and GEF issues allocating the funding extended the time preparation. The Project was originally conceived as a blended operation and complement to the Ministry of Agriculture project "Sustainable Agriculture and Rural Development Project" (P088799) Investment Financing Loan. This decision increased the Project's implementation challenges because the projects were managed by different entities and implemented in different timeframes, although the originally planned collaborative activities and strategies were maintained. However, the project was able to overcome these challenges.

96. The Project design reflected lessons learned from previous GEF operations in the country including: (i) the need to change implementing agencies, (ii) to engage the productive agricultural sector to mainstream biodiversity into the productive landscape, (iii) the importance of recognizing the expertise and views of local people and creating a sense of shared ownership of resources and project participation. The project design also built on the two GEF-funded initiatives that supported the Mbaracayú and San Rafael Protected Areas that became the backbone of the proposed Atlantic Forest corridor in Paraguay, as the northern and southern core areas.

97. The proposal to engage the largest hydropower plant in the region belonging to two countries as the implementing agency was a nontraditional approach and the project innovated in engaging ITAIPU as the leading implementing agency because it provided substantial managerial capacity and potentially significant counterpart funding, that over the long term were proven to be key to fully achieving the project outcomes.

98. The area of intervention defined for the project was very large (1.14 million ha) covering 6 departments, 55 municipalities of Paraguay including a complex social, economic and environmental contextual area to be covered with the available funds and in only 42–48 months of expected implementation period.

99. Some of the Project outcome indicators overlapped with intermediate outcome indicators. As it was usual at the time of project preparation, the GEO was ambitious and dealt

with long-term biodiversity conservation and restoration gains that are harder to measure in the short lifespan of the Project cycle.

100. Another shortfall at entry was the covenant requiring special semi-annual concurrent technical-financial audits requested by the financial team that proved to be very difficult to implement given the lack of these types of services in the market. This seems excessive, considering that infrastructure projects in the Paraguay portfolio and designed at the same time with funding of more than US$ 50 million were not subject to the same covenants.

(b) Quality of Supervision
Rating: Satisfactory

101. The Bank, through its TTLs and specialists, provided constant support during implementation with a total of 18 missions from effectiveness to closure, with an average of 3 missions per year. During the last year, the team did not have supervision funding and videoconferencing and other tools were used to maintain the oversight of the project. The country political and institutional context proved highly challenging. The institutional leadership changes were significant in all institutions involved along the project life. Aide memoires and ISRs indicate a sustained effort to ensure that the project milestones were met particularly at effectiveness. In addition, significant efforts were made to adapt to the changes requested in governance structures designed for the project at behest of the SEAM primarily during the 2008–2010 period.

(c) Justification of Rating for Overall Bank Performance
Rating: Moderately Satisfactory

102. The support was continuous and sustained during implementation with the Bank playing a significant role to bring the different agencies together to address this conceptually new approach to landscape management. In addition to the implementation support missions, the Bank clearly understood the institutional realities and relative capacities of the implementing agencies. The Bank recognized, from the design phase, the relative strength of ITAIPU compared to other potential partners and recognized its willingness to implement. Consequently, in 2013 the Bank supported the extension of the project closing date, allowing project funds to be fully disbursed and achieve the outcomes set forth. Some shortcomings are noted in quality of entry regarding targets and preparation time.

5.2 Borrower
(a) Government Performance
Rating: Moderately Satisfactory

103. Government performance was Moderately Satisfactory given the lag to effectiveness once the project had been approved. The coalition government that oversaw the beginning of implementation was different from the one that had developed the project, while the implementing agencies were divided among different factions of this coalition. The SEAM insisted on changing the institutional arrangements until 2011, which were not implemented to avoid additional delays and risk related to the assignment of a greater role to a weaker implementing agency.

104. The transitional government following the impeachment of President Lugo saw the project through until 2013, maintaining the project functioning at a basic level and preparing the technical basis and terms of reference for the implementation once all the covenants had been overcome. One of these covenants, as described previously, generated complications given it required services that were not readily available in the country. In 2013, with a single-party government in place and greater levels of political will to implement the project, the government requested an extension of two years of the closing date that was used efficiently to achieve the restructured objectives of the project.

(b) Implementing Agency or Agencies Performance
Rating: Satisfactory

105. **ITAIPU.** The primary implementing agency initially took some time to get the project started, since it needed to assume the role of implementer of an externally funded project rather than its traditional role as a financier of projects. However, it did have a sophisticated managerial structure that allowed it to advance rapidly once the intra-institutional hurdles were overcome with the new government in 2013. With the change in leadership in ITAIPU and the strong support from the highest levels of the entity to advance with the project implementation, the project unit was competent to mobilize the human and counterpart resources effectively to produce the results expected in a short period with a relatively good level of quality. It was able also to overcome with its own resources the shortfall in counterpart funding from the MAG/PRODERS and to deal with the complicated covenant regarding technical-financial audits that had been included in the legal agreement and impeded the advance of the project activities at the outset.

106. **SEAM.** Despite of the limited personnel and budget to have presence in the Corridor, SEAM took the opportunity in the last 2 years of the project to build an alliance with the project and ITAIPU and supported its main activities of interest to benefit the PA system.

107. **MAG.** This Ministry was already well on its way to implementing the PRODERS project starting in 2008. AF was provided by the World Bank as follow-on to the successful parent phase for US$100 million. However, the project has been disbursing poorly but is now on a timetable for expedited implementation to the end of 2017. This includes many new technical service providers to support restoration and forestry subprojects that are largely a result of the relation to the Paraguay Biodiversity project.

(c) Justification of Rating for Overall Borrower Performance
Rating: Moderately Satisfactory

108. ITAIPU Binacional, the project's lead agency, provided the leadership that allowed the project to achieve its GEO with a reasonable extension of the project that provided a more realistic timeline for the type of investments proposed, which require a lengthier participatory planning process. While the lead agency performance was satisfactory, the partners in the implementation faced political difficulties to support it. MAG has significant institutional capacity for implementing projects, including World Bank funded projects, but the implementation of PRODERS lagged somewhat during the final years of the project. This

however did not have a significant effect on the targets that were supposed to be supported by PRODERS as ITAIPU covered the financial gap created by the lack of implementation of PRODERS. SEAM was less of a protagonist than a participant in the implementation along with INDI. Both agencies, while having significant formal roles, have important financial and personnel limitations to cover and outreach the far areas of the Corridor.

6. Lessons Learned

109. **Landscape approaches should engage the broadest cross-segment of civil-society and private-sector groups as possible.** This strategy proved to be effective in engaging not only small-producer groups but also leveraged the financial, logistic, and technical capacity of the private sector that may see the initiatives as a good investment as well as a fundamental part of their social responsibility programs. NGOs provide important platforms to work with rural communities, particularly IP communities that need substantial technical support for developing restoration and sustainable production projects. Local governments also have a key role in facilitating activities in the landscape.

110. **Sustainable landscape management and restoration projects require longer timeframes**. Four year implementation timelines, which typically are reduced even more due to effectiveness delays in developing countries, is not a substantial time to create the platforms for developing projects with Indigenous communities and small-farmer groups that may require extra support over multiple years or that are subject to seasonality to ensure that investments such as forest plantations and sustainable production activities, reach the proper levels of maturity and productivity in addition to the required capacities to be self-sustaining.

111. **The participation of indigenous communities and INDI in the overall project activities was critical to reach the project outcomes.** Indigenous peoples hold some of the largest forest areas in the Atlantic Region, therefore their interest to engage in the project was very important but also challenging since these suffered of lack of inclusion, expropriation, respect and basic services typical of the poor rural areas of Paraguay. The project committed to overcome all these challenges by adjusting project methods to their languages, culture, vision, and interest.

112. **Innovation and adaptability is required for unforeseen project challenges.** While planting trees seemed to be a straight-forward activity during design, the reality of leaf-cutter ants was somewhat unexpected in terms of its scale, and required the project to implement measures to step up to the challenge posed to some of the most important investments of the project. This learning and the platform established have now been mainstreamed into the PRODERS project, and will follow into the future ITAIPU landscape restoration investments in Eastern Paraguay for years to come. The project has created a good interest of large-scale producers to create private protected areas from remnants of their lands and interest for environmental services certification.

113. **Under weak institutional frameworks, sophisticated economic incentive schemes do not work properly**. Under the current capacity constraints experienced by the environmental institutions in Paraguay, the high prices for land and incentives to cut the forest, technical assistance, communal participation and support for environmental certification

mechanisms proved to be far from effective when it comes to creating incentives for private conservation or the adoption of best productive management practices.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

(b) Cofinanciers

There were no co-financiers of the project.

(c) Other partners and stakeholders

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD million equivalent)

Components	Appraisal Estimate (USD millions)	Actual (USD millions)	Percentage of Appraisal
Component 1: Re-establishment of Connectivity between Protected Areas	12.00	11.86	99%
Component 2: Strengthening and Expansion of the National Protected Areas System	1.82	1.86	102%
Component 3: Enhanced Policy Framework and Institutional Strengthening	2.95	2.96	100%
Component 4: Project Management, Monitoring, and Evaluation (Including Contingencies)	1.52	1.91	126%
Total Baseline Cost	**18.29**	**18.59**	**102%**
Physical Contingencies	0.00		
Price Contingencies	0.00		
Total Project Costs	**18.29**	**18.59**	**102%**
Project Preparation Facility (PPF)	0.00		
Front-end fee IBRD	0.00		
Total Financing Required	**18.29**	**18.59**	**102%**

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual (USD millions)	Percentage of Appraisal
Borrower (ITAIPU)		6.00	9.74	130%
Beneficiaries		1.48	0.83	56%
IBRD Lending operation (PRODERS)		6.31	3.53	56%
Global Environment Facility (GEF)		4.50	4.50	100%
TOTAL		**18.29**	**18.60**	

Annex 2. Outputs by Component

The Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay Project consisted of a US$4.5 million Global Environment Facility (GEF) grant partially blended with a US$6.31 million IBRD loan to the Ministry of Agriculture and Livestock (MAG) and US$7.48 million of recipient/beneficiary contribution through the counterpart agency ITAIPU Binational (IB) in cooperation with MAG and the Secretary of Environment (SEAM). The total of US$18.29 million was to be originally disbursed over the period between September 2010 and April 2014.

The project was designed with four components:

1. Re-Establishment of Connectivity between Protected Areas. The objective of this component is to maintain or re-create the connectivity between protected areas in the proposed Conservation Corridor, which would provide continuous biological links to enable a crucial flow of genetic resources between the large forest remnants within the corridor.
2. Strengthening and Expansion of the SINASIP. This component will strengthen the SINASIP, composed of public and private protected areas (including those owned and managed by ITAIPU), within the proposed conservation corridor.
3. Enhanced Policy Framework and Institutional Strengthening. The objective of the proposed component is to strengthen the institutional capacity and coordination of Member Country's institutions responsible for management of natural resources and biodiversity.
4. Project Management, Monitoring and Evaluation. The objective of this component is to facilitate the execution of the Project through the establishment of a Project Management Unit (PMU) and to ensure monitoring and evaluation.

Component 1: Re-establishment of Connectivity between Protected Areas
This component sought to support 222 restoration subprojects, 254 sustainable use of biodiversity subprojects, 286 socio-productive initiatives, and to advance participatory planning of 20 micro-catchment areas. All these restructured targets were achieved and exceeded at closing (315, 797, and 339 subprojects respectively for each typology). In addition, 291 subprojects were also completed with 55 different IP communities in six departments of Paraguay. This is in line with the Indigenous Peoples Planning Framework prepared for the project as well. The 22 micro-catchment subprojects were completed with half of them implemented through the partially blended PRODERS project of MAG and the other half through the IB implementation window.

The fact that the targets were achieved and exceeded is particularly notable given that there were significant hurdles to overcome in terms of the timing of the implementation that coincided for fiduciary reasons with the least favorable time of the year for planting while also facing significant challenges in forestry projects due to leafcutter ants becoming a significant source of pests for plantations. Another important factor for ensuring implementation and sustainability of these subprojects was the agreement of the Inter-American Institute for Agricultural Cooperation (IICA) to support the technical assistance, supervision, and oversight of these productive and restoration investments. The project organized an international forum

on biodiversity and corridor management in late 2015 that enabled sharing of project results. The forum also enabled IB to extend its international network of contacts and partnerships for conservation and sustainable development programs including an agreement with the Smithsonian Institution.

Micro-catchment planning activities were associated directly to the productive subprojects for greater effectiveness and complementarity. Producers were guided through workshops to prepare an assessment of the environmental and natural resource challenges of their productive landscapes. Women and men discussed each other's roles in terms of social, economic, and environmental dimensions. Plans were developed and formally endorsed by the participants. In terms of direct beneficiaries under this component, 21 percent were women and 79 percent men.

Medium and large-size producers were also brought into the program, and they provided significant capacity and counterpart investments of their own based on their interest in the project objectives. They provided their own funds in establishing forest committees in the case of the COPRONAR cooperative and have a large membership base in which these forestry initiatives can be extended. The fact that there was incentive funding was seen as critical to advance investments with the medium producers given the costs and shows the good potential that an effective payment for environmental services scheme could generate for forest restoration.

The project also considered long-term impacts on the forest through the introduction of improved woodstoves. Paraguay generates around 40% of its energy from biomass that comes primarily from native forest wood and the charcoal produced from it. Families spend almost $200 per year to purchase fuelwood; hence, the pressure on native ecosystems is substantial. This was also significant, since the purchase was a "south–south" investment, given that, the project purchased the stoves from a company based in Lesotho. The stoves will provide IP communities a more efficient stove and more efficient use of wood; the stove has a USB port that generates electricity with a small solar panel to charge cellphones, making it very useful in remote communities with unreliable or without electric service.

Component 2: Strengthening and Expansion of the National Protected Areas System (Total of US$ 1.815 million of which US$ 0.57 million was GEF-funded). This component seeks to ensure that the core areas that are connected by the corridors are strengthened to ensure they remain the main repositories of biodiversity of the UPAF of Eastern Paraguay. This support would include preparation of participatory management plans for four public protected areas, establishment of infrastructure for two protected areas, advancing legal tenure and administrative improvements in two areas, advanced proposals for 10 private protected areas and increase the hectares under private protection to 124,734 ha.

This component had important advances to consolidate the National Protected Areas System (SINASIP). One of this component's key achievements has been the transfer of 500 ha to the SEAM for establishment of the first public portion and core area for San Rafael National Park. This had not been achieved in the decades prior to the project for both governance reasons and financial limitations of the protected-areas authority, given that the area has some of the highest-priced property in Paraguay due to its location and potential agricultural productivity.

Lack of land titling is also a long-standing legacy of the protected areas of Paraguay. This lack has allowed encroachment from all sides of the declared reserves given the lack of definition of boundaries. Formal title was obtained for SEAM for Ñacunday National Park and San Rafael National Park.

The private protected areas system of Paraguay was also advanced. This is a key component of the SINASIP given the lack of public land in Eastern Paraguay to establish new protected areas in addition to the high cost of property in the several thousands of dollars per hectare when located in prime agricultural areas. Six private reserves were created from a pool of 13 properties that were evaluated. Two have been officially recognized (RN Yguazu, Reserva Natural Pozuelo) while three already have their technical justification prepared and presented for approval (Carla Maria, Reserva Acaray, and Estancia Pindo). Three properties were supported to qualify for payments for environmental services and one signed a cooperative agreement for support of organic certification of production of non-timber forest products (palm hearts and yerba mate tea).

The project advanced the preparation of three (of four) new management plans, including Ñacunday National Park, Ybytyruzu Managed Resources Reserve, and San Rafael. San Rafael/Tekoha Guasu, given its characteristics required a different approach. In the case of this last park, the Indigenous groups within the park requested that a participatory platform for dialogue and consultation be established rather than directly develop a plan for the park. This recognizes the fact that the park is in fact a conglomerate of private and Indigenous reserve land rather than public government property. This process has achieved an agreement called the "Caronay Agreement" that recognizes the role of the IP and their relation to the forest. The agreement incorporates 7,200 ha of forest under PES schemes achieved by Guyra Paraguay and the commitment was made to support the 13,000 ha that are comprised of IP lands under PSA schemes and to advance community resource planning/mapping that would potentially be supported by follow-on activities being considered by ITAIPU and other entities as possible.

Biodiversity is not systematically monitored in public and most private protected areas of the SINASIP. The project advanced with establishing a methodology and baseline for biodiversity monitoring in 16 protected areas including seven private reserves. The baselines were established for bird diversity and included in a publically accessible database on ebird.org.

Another set of activities to enhance sustainability of the protected areas and their management plans was through tourism development activities and infrastructure construction. This included the design of tourism programs for Yguazu National Reserve, Maharishi private reserve, San Rafael and Ybytyruzu protected areas. Construction of infrastructure included the remodeling and upgrading of infrastructure of Ñacunday National Park and the designs were also prepared for a guard post in Caazapá NP and construction is ongoing for an entry gate and guard post in the 500 ha public core area in San Rafael NP.

The Carapá River corridor, which is an important biological link between Mbaracayú Reserve and the ITAIPU reservoir and reserves, was also advanced significantly with 1,000 ha added to the 1080 ha of restored habitat that had been established at the outset of the project. The eight reserves of ITAIPU also underwent formal demarcation, management planning, and the

processes advanced for SEAM to recognize the areas under ITAIPU management as part of a subsystem of protected areas within the SINASIP.

Component 3: Enhanced Policy Framework and Institutional Strengthening (Total of US$ 2.951 million of which US$ 1.685 million was GEF-financed). Three government agencies were strengthened with support of this component including SEAM, MAG, and the National Indigenous Peoples Institute (INDI). INDI, which is one of the weaker government institutions in both budget and personnel, was supported through direct investments in its infrastructure including the upgrading of offices for their social and environmental unit. The functional design of this unit was also advanced in coordination with SEAM. The unit was established with two lawyers (especially to support land-titling activities), one anthropologist, one forestry engineer, and a GIS and an IT specialist. A truck was also provided to the institute and training provided throughout the institution on several topics such as agro-forestry and pest management, among others.

SEAM received much of the institutional support as a key player in the protected areas system and given its limited resources to achieve its mandate over such a large landscape that includes Eastern Paraguay and the Chaco of western Paraguay that harbor several million hectares of protected areas. Both infrastructure and "soft" investments to support the capacity of SEAM were made. These include the construction of new offices for the General Directorate for Conservation and Protection of Biodiversity in charge of administering the SINASIP. A vehicle was also provided for this unit of SEAM. Regarding capacity building several programs were supported to advance themes such as decentralization of natural resources management, forest certification, valuation of environmental damage and training of judges and district attorneys as part of enforcement training and, agroforestry and ecosystem restoration training. The planning unit of SEAM was also supported with several consultants.

Policies for biodiversity conservation were also supported and advanced including some standards for environmental impact assessment of small-scale activities, implementation of the National Environmental Fund based on existing legislation, and establishment of criteria for determining and quantifying environmental damage to forests from deforestation and degradation that can help with future enforcement efforts. A proposal was advanced to regulate the so-called "managed resources reserve." This category of protected area is particularly challenging given it is a reserve declaration over lands that are typically primarily in private hands. The mandate primarily one regulates land use and change, involving many levels of public and private sector management of the territory. A study to determine the hydrological balance of the upper Tebicuary River within the UPAF was also prepared supporting the planning efforts regarding expansion of rice plantations in Eastern Paraguay. An international forum on biodiversity corridors was sponsored in 2015 (with more than 600 participants) that advanced regional dialogue and coordination on the concept of corridors.

Substantial efforts were made within the project landscape to support training and environmental education. Special materials on the UPAF were prepared and disseminated to schools and teachers in the ecoregion and integrated as part of the curriculum in public schools in the target departments of the project with formal recognition of the Ministry of Education. 5,445 participants in 108 workshops were sensitized to the issues of conservation within the corridor. A website and presence on social media including Facebook have enhanced and

contributed to extending the understanding of the corridor and need for conservation and restoration as well as highlighting the efforts. The website has registered over 34,500 visits while the Facebook page has 8549 subscribers to date. Signs have also been provided for information along roads and within protected areas. The project has supported a significant number of seminars and eco-fairs at municipal level in departments where few opportunities are available for this type of training and environmentally focused activities.

Component 4: Project Management, Monitoring, and Evaluation (total of US$ 1.52 million of which US$ 0.43 million was GEF funding). This component included three different monitoring systems to be developed in support of the project including some for longer-term monitoring. The systems include design and implementation of a project-monitoring and evaluation system, design and implementation of a land-use monitoring system and, design and implementation of a project integrated management information system. The project developed some important monitoring and evaluation systems for the long-term support to biological monitoring in Paraguay. In addition to the biodiversity baselines developed for bird fauna in the corridor, the project provided SEAM, in coordination with its National Museum of Natural History, with a cloud-based biodiversity information management system for all its biological information and migrated existing data while providing a platform for future data to be entered and managed in a more collaborative way. In support of project management, a tool was developed to be able to follow both the financial and project objective related advances. The system is also web based and allows for online monitoring of implementation and planning of activities.

Access to information. The project also developed a web portal to provide information publically to national and international audiences. This website has garnered over 34,500 visits since 2013 and can be viewed at http://www.paraguaybio.com.py/. It includes information on all project activities and contracts supported through the project. Transparency, which was an area of risk identified during preparation, was mitigated via these electronic systems for dissemination of calls for proposals and contract details, which are publically available for review (more information is provided in section 2.4). Social media was also used effectively as well with a dedicated Facebook page that currently has over 8,500 followers.[15]

[15]https://www.facebook.com/Paraguay-Biodiversidad-1528526954041746/

Annex 3. Economic and Financial Analysis

A3.1 Introduction

The significance of ecosystems is seldom adequately recognized in economic markets, government policies or land management practices. The tendency to underestimate the value of ecosystems is related, for the most part, to their "public good" quality. Ecosystems and the services they provide are owned by all and, thus, protected by none. They generate shared benefits and so encourage free riding. Being publicly provided, they are underpriced or un-priced and thus tend to be overused and abused. Since the benefits are shared and ownership is collective, there is a tendency to free ride on contributions for the provision of these goods. Collectively, these features lead to pervasive degradation of ecosystems because of systemic market failures.

Acknowledging the challenge of sustainable natural resource management and conservation of the environment, the Conservation of Biodiversity and Sustainable Land Management project in Paraguay is designed to improve the sustainable and efficient use of forest resources, conserve biodiversity in protected areas and forest landscapes, and integrate small producers into forestry development and conservation. The investment will result in the provision of private and public goods, not least enhanced sequestration and long-term storage of carbon, conservation of biodiversity, climate adaptation and climate resilience benefits, improvement of watershed management, improved income opportunities for small forest landholder and existence values. The proposed investment will also generate an increased provision of timber and non-timber products for consumption stipulating enhanced economic opportunities and growth.

This section presents an analysis of the economic (welfare) benefits generated by the proposed investment. By estimating the (partial) values of changes to core ecosystem services, and comparing them against the cost of the proposed investment, the overall economic welfare generated by the project is assessed.

A3.2 Economic Benefits Generated by the Project

This analysis uses the achieved outcomes originating from establishing a conservation corridor through sustainable native forest management practices on 103 873 ha, encouraging sustainable agricultural practices on 125 015 ha, and strengthening the National Protected Areas System on 169 620 ha. This approach is very conservative as it strictly only evaluates the environmental benefits from the project. Other achieved outcomes are not considered such as the effect of enhanced policy framework and institutional strengthening, empowerment of indigenous communities or the economic benefits from trainings for small-scale producers.

With its different components and multiple areas of investments, the project generated a diverse portfolio of economic benefits ranging from direct, tangible benefits to indirect, intangible benefits. A direct, tangible benefit is, for example, the increase in tourism income through an increase in tourists to national parks. On the other side of the scale, indirect and

intangible economic benefits of the project are, for example, the improvement of the public administration and the associated delivery of public services triggered by the capacity building of the forest administration supported by the project. Table A3.1 provides a limited overview of selected examples of the four categories of benefits that could be associated with the project.

Given the difficulties of assigning monetary benefits to the entire range of economic benefits generated by the project, this analysis does not assess intangible indirect effects. For this project, the ex-post economic analysis was based on areas under improved sustainable land management, conservation, restoration, or biodiversity protection. Other economic benefits that were not included are, for example, increased human capital, improved governance structures, biodiversity values, bequest values, and many more. Further, the economic benefits included in the analysis were strictly limited to those immediately generated and associated with the project. Other benefit effects, such as, future improvements of forest management due to the capacity building in the administration are not included.

Table A3.1 Non-Exhaustive Selection of Economic Benefits Generated by the Project

	Tangible	Intangible
Direct	• Improved forest management • Tourism • Sustainable timber use	• Biodiversity conservation • Reduction in GHG emissions • Reduction in deforestation
Indirect	• Increased resilience to external shocks • Improved watershed services (for example, for drinking water, hydropower generation, and others)	• Reduction in soil erosion • Enhancing institutional mechanisms in support of decentralization and delivery of public services by the Forest Administration • Strengthened self-governance capacity of communities and community groups • Regulatory frameworks for forestry are in place

A3.3 Main Assumptions and Cost Factors

Cost-Benefit Analysis was applied to conduct the economic efficiency assessment for this project. Sensitivity analysis is applied for the main simulation parameters notably discount rate and project horizon. For the discount rate, alternative rates of 5%, 10%, and 20% are applied. To test the robustness of initial results the economic benefits are reduced by 20% and 50% and the opportunity costs of land are increased by 500% in subsequent analysis. All sensitivity analyses are run for all discount rates scenarios. The results of the quantitative results will be complemented with qualitative benefits to conclude overall project feasibility. It is assumed that improvements in forest management have been distributed evenly throughout the project lifetime—that is, the increases of forest areas under improved management are the same in every year. The economic benefits and costs are largely based on a spatial evaluation

of the costs and benefits of conservation for a landscape in the Atlantic forests of Paraguay from Naidoo and Ricketts (2006).[16]

Time

The distribution of costs and benefits over time is congruent with the disbursement of the project. This means benefits start only to arise after the first disbursement and with the baseline evaluation in 2013. After 2016 it is assumed that benefits remain constant and no further improvements or damages occur, even though it is likely that the project will trigger improvements in the future without substantial additional costs.

Opportunity cost of land

Opportunity costs are costs of foregone opportunities, that is, they are a measure of what could have been gained via the next-best use of the land (for example, agriculture) had it not been put to under conservation. From a social perspective, it is important to include opportunity costs to track the full set of consequences of conservation planning. The opportunity costs of conservation in Eastern Paraguay are heterogeneous and vary between 0 to 927 USD/ha. The Variation is related to a number of factors, such as land tenure (protected areas and indigenous reserves have low opportunity costs due to low conversion rates), slope (steeper slopes have lower deforestation rates and therefore lower costs), and soil type. The highest opportunity costs of land can be found in areas suitable for soybean farming, which is the most profitable land use in the region (for details see discussion section). The average opportunity costs of conservation are US$ 60/ha and are used in this analysis. A value of 300 USD/ha is used for a sensitivity analysis.

Project Costs

Project costs are approximated using the investment costs of the proposed project totaling USD 18.6 million, which include the GEF grant and counterpart contributions. The costs are evenly distributed over the period of 2013–2016. Using only the actual disbursements from the GEF yield qualitatively very similar results and are hence only used as a robustness check. It is not differentiating between project components, since benefits from enhanced policy framework, institutional strengthening, monitoring and evaluation are not evaluated.

Climate and Carbon

Carbon sequestration and storage values of forest ecosystems are different from climate regulation benefits, encompassing broadly adaption and resilience services. Climate regulation benefits are additional values provided by forest ecosystems. Naidoo and Ricketts (2006) estimated a carbon storage value of 378 USD/ha for Eastern Paraguay. Their estimate is based on a carbon market price of 2.5 USD/tCO2, which is very conservative considering that current prices are more than two times higher. The resulting value of USD 9.17 per ton carbon is also at the lower bound of the range of estimates for carbon prices from other studies

[16] Naidoo, R., and T. H. Ricketts. 2006."Mapping the Economic Costs and Benefits of Conservation."*PLOS | Biology* 4(11):2153–64. http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.0040360

(1–130 USD/tCO2; World Bank 2015[17]). Likewise, the carbon storage value is in line and at the lower bound of other studies for tropical forest. In a case study of Cameroon, TEEB (2009) states that associated values range between 842 and 2,265 USD/ha. Pearce et al. (2001) states values for the same service to range from 360 to 2,200 USD/ha. For this analysis, the rather conservative value of 378 USD/ha is assumed.

Bushmeat harvest

Hunting for wild meat is one of the most important economic activities for some of the indigenous groups and is practiced by 'campesinos' and large landowners. Since bushmeat is not traded on markets, beef was used as a proxy for the value of bushmeat. Beef constitutes a reasonable substitute to meet protein requirements for humans. The estimated amount of kilograms of bush meat that can be hunted sustainably is multiplied with the local market price of a kilogram of beef. Especially for indigenous groups hunting can be an important tradition and have an economic value that goes beyond this estimation. The economic value of bush meat harvest that is estimated and used in this analysis is USD 15.59/ha.

Bioprospecting

Natural habitats (especially tropical forests) can serve as a provider of new medicines that may benefit humanity. This creates economic values and justification for conservation. Using data from a willingness to pay (WTP) study of pharmaceutical companies for the potential of tropical forests to contain precursors to new marketable drugs Naidoo and Ricketts (2006) estimate the economic value. Their results yield an economic benefit of 2.21 USD/ha, which is used in this study to assess the value of bioprospecting.

Sustainable Timber harvest

Harvesting timber at a low rate can be a sustainable use of forest resources if regeneration and the long-term well-being of the forest are taken into consideration. Naidoo and Ricketts (2006) assessed the potential sustainable flow of a limited timber harvest from forests in Eastern Paraguay. Under the assumption of an annual harvest rate of four trees per hectare with a 30-year harvest cycle and using a value per tree of USD 6.87 the value for timber harvest is 27.60 USD/ha. This value is very conservative considering that other studies estimate the value of sustainable logging between 300–2660 USD/ha (Pearce et al. 2001). For this analysis, the conservative value of 27.60 USD/ha is used.

Existence Values

Estimates related to the "existence value" associated with preservation (non-use) of forests show a wide variety of values in the literature. The studies carried out tend to be based upon contingent valuation in rich countries where people appear to be willing to pay for the costs of preserving natural species and places. Horton et al. (2003), use a contingent valuation study that is applied to the specific case of the willingness to maintain conservation units in Amazonia detected among a sample of people in the United Kingdom and Italy. Two

[17] Kossoy, Alexandre, et al. 2015. *State and Trends of Carbon Pricing 2015*. No. 22630. Washington, DC: World Bank.

possible conservation scenarios are presented, based on conservation values of 5% and 20%. The study identifies an annual value in the form of an additional tax in each country, and not a single fixed value to be allocated by an international fund. The average value estimated, combining the samples in both countries, was 50 USD/ha for 5% of the area of Amazonia, and 67 USD/ha for 20 % conservation. When the order of the questions was inverted (first 20%, followed by 5%) the average estimates changed to 36 USD/ha and 50 USD/ha, respectively. Referring to the same study, TEEB (2009) estimates existence values at 43 USD/ha. Pearce et al. (2001) provides a range of existence values between 2–12 USD/ha. For this analysis, the most conservative value of 2 USD/ha was applied.

Watershed values

Given the important role of tropical forests with respect to hydrological functions, watershed values are the sixth and last category of benefit values included in the quantitative economic assessment. Naidoo and Ricketts (2006) did not include watershed values in their analysis because of a lack of data. Other studies, however, estimated the general value of watersheds. For example, TEEB (2009) states the economic value of intact tropical forests is 6,120 USD/ha, which is significantly higher than any of the values assumed in this assessment (however, it is not fully clear which values are considered in TEEB's assessment). Pearce (2001) values watershed benefits for tropical forests at a range between 15 and 850 USD/ha, with the higher-bound value applying to tropical forests. The World Bank[18] estimates watershed values at 129 USD/ha for developed and 27 USD/ha for developing countries, respectively. Again, following a conservative approach, the baseline value assumed for this analysis is 27 USD/ha, even though the economic importance of the watershed for the ITAIPU dam would justify a higher value (for details see discussion section).

A3.4 Methodology

A net present value analysis is applied to compare project's net benefits and net costs at time of the baseline evaluation (2013). In addition to applying conservative values for the quantitative assessment, sensitivity analysis is applied in various ways for the key simulation parameters, notably discount rate and assessment of benefit variation. Alternative discount rates of 5%, 10%, and 20% are chosen, with 20% significantly exceeding what has recently been recommended as average "default" discount rates for project analysis by the World Bank. Quantitative results will be contrasted with qualitative benefits to arrive at overall project feasibility.

As is required for the economic analysis of projects, a "with" and "without" project situation is used for estimating incremental benefits generated by the project. The factual situation (with project) of forest conservation is compared to a hypothetical counterfactual (without project) situation of complete deforestation. The difference between the "with" and "without" project situation is simulated using the cost values outlined in the previous section. Complete deforestation is used as counterfactual situation, even though prior to project

[18] The Changing Wealth of Nations – Measuring Sustainable Development in the New Millennium (2011).

implementation the region was not completely deforested. This approach avoids arguably very subjective assumptions that would be necessary to determine the fraction of environmental benefits a forest is generating through forest conservation compared to a non-conserved forest.

As a sensitivity test, a 15-year and 20-year lifespan of the project as well as different discount rates are used to assess the economic feasibility of the project. While direct project costs only occur during the first four years of the project, benefits are assumed to be generated beyond the lifetime of the project as well as opportunity cost for alternative land use. To harmonize project benefits and costs through the calculation of a present value of costs and benefits, a discount rate needs to be determined. Given the often-significant impact of the choice of the discount rate on economic analysis outcomes, and the common difficulty in determining discount rates reflecting economic discounting behavior, a sensitivity analysis is applied considering discount rates of 5%, 10%, and 20%.

In addition to testing the impact of different discount rates on simulation results, other sensitivity analyses are applied to account for possible variations in key input parameters and to test the robustness of simulation results. Although all assumed benefit values are already lower-bound estimations, focus on five core benefit categories only, and are only applied to areas that explicitly benefitted from the project (excluding spillover effects and positive externalities resulting from improved policy frameworks, research and monitoring), benefit reductions of minus 20% and minus 50% are tested. For the cost parameters, GEF contributions alone are used in addition to contributions from all counterparts. Moreover, in a sensitivity analysis it is tested whether five times higher land opportunity cost (300 USD/ha) yield different results. It has to be noted that in addition to using already conservative values, those are not adjusted from their publication year to current prices, which would result in an increase in values. This set of sensitivity assessments enables a comprehensive analysis of the economic robustness of the project relative to changing or differentiated value parameters.

A3.5 Results

Overall, results show positive simulation outcomes for the project, thus confirming the economic feasibility. Simulation results are summarized in tables 2 and 3. Each table shows the net present value (NPV) and the benefit-cost ratio (BC) for different discount rates and benefit variations. The benefits are more than six times larger than the costs throughout almost all scenarios and create a net present value of over one billion USD. The high NPV can be explained by the fact that opportunity costs of land and the benefits from conservation are accounted for in every year and therefore any difference between benefits and costs is magnified over time. Moreover, the area that has been conserved, restored, protected and put under sustainable management is very large—about the size of the Republic of Malta.

The performed sensitivity analysis shows that the results are robust even under much lower benefits and increased opportunity costs of land. The lifespan of the project has virtually no effect on the economic feasibility assessment, as values in table A3.2 and A3.3 are qualitatively similar. The positive NPV remain event when the benefits are reduced by 20 and 50 percent. Likewise, the results do not qualitatively change if only the GEF contributions are accounted for (table A3.4). Applying an opportunity cost of land that is five times higher than the average for Eastern Paraguay yields smaller but still positive NPV (see table A3.5). The

NPV only turns negative when the five times higher opportunity cost of land is used in combination with 50 percent reduced benefits. Overall, these sensitivity tests strengthen the confidence in the analysis.

TableA3.2 Summary of NPV and Benefit-Cost Ratio under Different Scenarios for Project Lifespan of 15 Years and Costs from All Counterparts

	Baseline		Baseline (-20%)		Baseline (-50%)	
	NPV	BC-Ratio	NPV	BC-Ratio	NPV	BC-Ratio
Discount Rate 5%	1095,647,355	6.49	836,637,731	5.20	318,618,484	2.60
Discount Rate 10%	771,055,107	6.34	587,987,212	5.08	221,851,421	2.54
Discount Rate 20%	435,565,667	6.04	331,182,642	4.84	122,416,592	2.42

Note: NPV = Net Present Value; BC-Ratio = Benefit Cost Ratio

TableA3.3 Summary of NPV and Benefit-Cost Ratio under Different Scenarios for Project Lifespan of 20 Years and Costs from All Counterparts

	Baseline		Baseline (-20%)		Baseline (-50%)	
	NPV	BC-Ratio	NPV	BC-Ratio	NPV	BC-Ratio
Discount Rate 5%	1,349,174,384	6.60	1,031,133,343	5.28	395,051,263	2.64
Discount Rate 10%	881,530,976	6.43	672,739,800	5.14	255,157,447	2.57
Discount Rate 20%	459,195,995	6.09	349,310,868	4.87	129,540,612	2.44

Note: NPV = Net Present Value; BC-Ratio = Benefit Cost Ratio

Table A3.4Summary of NPV and Benefit-Cost Ratio under Different Scenarios for Project Lifespan of 20 Years and Costs Only from GEF

	Baseline		Baseline (-20%)		Baseline (-50%)	
	NPV	BCRatio	NPV	BC-Ratio	NPV	BC-Ratio
Discount Rate 5%	1,112,389,706	7.09	853,380,083	5.67	335,360,835	2.84
Discount Rate 10%	786,236,585	7.09	603,168,690	5.67	237,032,899	2.84
Discount Rate 20%	448,302,271	7.09	343,919,246	5.67	135,153,195	2.84

Note: NPV = Net Present Value; BC-Ratio = Benefit Cost Ratio

Table A3.5Sensitivity Analysis Using Higher Land Opportunity Costs (300 USD/ha) – NPV and Benefit-Cost Ratio for the Project until 15 Years after Project Start, Including All Counterpart Costs

	Baseline		Baseline (-20%)		Baseline (-50%)	
	NPV	BC-Ratio	NPV	BC-Ratio	NPV	BC-Ratio
Discount Rate 5%	365,013,720	1.39	106,004,096	1.11	-412,015,152	0.56
Discount Rate 10%	254,643,555	1.39	71,575,659	1.11	-294,560,131	0.55
Discount Rate 20%	141,114,256	1.37	36,731,231	1.10	-172,034,819	0.55

Note: NPV = Net Present Value; BC-Ratio = Benefit Cost Ratio

A3.6 Discussion

This ex-post economic efficiency analysis conducted for the Paraguay – Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay Project confirms the positive economic impact the project was expected to generate. The results of the quantitative simulations are also robust across a range of sensitivity analyses assuming significant changes in discount rates and key benefit and cost parameters. Throughout the analysis, it was emphasized that benefit assumptions are always done conservatively using lower-bound values of associated non-market benefits attributed to the project.

The opportunity costs of land might be higher, if the conserved land areas contain mostly very rich soils that allow profitable soy plantations. Even though land prices can be around 5000 USD/ha in some regions, this analysis uses an opportunity cost of 60 USD/ha for two reasons. First, land prices are not the same as opportunity costs of land. Opportunity costs include all input factors (labor, seeds, machinery, and so forth) not only the value of the land. Moreover, amortization of the land acquisitions cost is typically achieved only after several years or decades. Second, comparability of cost and benefits values is easier ensured if they come from the same source. Naidoo and Ricketts (2006) calculated both, the benefits and the cost in their study. The average of land opportunity cost from their study is the best available estimate for this analysis.

The value for watershed protection, in contrast, could be much higher due to the importance of the watershed for hydroelectric generation in ITAIPU. The affected watershed drains towards the ITAIPU dam. The dam has an extraordinary importance for Paraguay because it is supplying approximately 75% of Paraguay's electricity consumption. Watershed protection includes benefits for water supply, water quality, flood control, sediment control, and navigation and thereby facilitates a constant electricity generation from ITAIPU. It would hence also be justifiable to use a watershed value closer to the upper bound of the watershed values (15–850 USD/ha) from Pearce et al. (2001), which is not done for the sake of a conservative analysis.

The quantitative analysis was also strictly limited to values that can be clearly attributed to the project. Besides, the areas that have been explicitly conserved, restored, protected or put under sustainable management by the project, additional benefits can be associated with economic benefits arising from the development of microenterprises in indigenous communities, better public service delivery resulting from capacity building of the forest administration and specialized training to beneficiaries (farmers and indigenous communities). Further, it was assumed that benefits would not further change beyond the project implementation period, even though it is likely that positive effects will continue to generate positive incremental changes compared to the without project situation. While this approach systematically undervalues project impacts, it provides a high degree of robustness. If additional and downstream project benefits had been considered the simulations would have yielded even stronger results.

Probably one of the most important, though so far unstated, economic impacts of the project relate to the capacity building of government institutions at central and decentralized levels. Enhanced capacities of government institutions will be improving public service delivery with numerous benefits and positive economic impacts. Especially with the

continuing challenges of natural resources management – not least due to climate change – the aspect of enhanced functioning of public institutions cannot be underestimated, particularly in a "with" and "without" project scenario. Enhanced functioning of government institutions will also facilitate the implementation of future projects and investments that will build on and continue the achievements of this project. Similar considerations apply to knowledge generation and management achieved by the project.

The targeting of the most impoverished sector of the Paraguayan population, its rural small-scale farmers and Indigenous Peoples is a great achievement that has not been quantified in this analysis. The project reached indigenous communities in large numbers (2,283 families representing 10,636 people) providing training on sustainable use of natural resources, Legislation and Indigenous Rights. These activities will empower the beneficiaries and create improved economic possibilities for these families, and thereby contribute to the elimination of poverty. Benefits from these activities are not accounted for in this analysis, even though they are of exceptional importance.

In summary, based on this economic evaluation, it is concluded that the project has resulted in significant positive development impacts. The consideration of only a few of those benefits into the quantitative analysis sufficed to yield positive economic results. The achieved economic benefits comply largely with what was anticipated during the design stage of the project. This supports the design and implementation of the project, in particular the selection of activities in which the project invested. It demonstrates that investments in sustainable natural resource management can significantly contribute to the economic development ambitious of transition economies such as Paraguay as they generate and safeguard important direct environmental services and instigate economic development.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team Members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Michael G. Carroll	Lead Nat. Resources Mgmt. Specialist (former TTL)	ECA	
Marcelo Acerbi	Sr. Environmental Specialist, TTL	LCSEN	
Natalia Cecilia Bavio	Financial Management Analyst	LCSFM	
Andres Mac Gaul	Sr. Procurement Specialist	LCSPT	
Dinesh Aryal	Sr. Natural Resources Mgmt. Specialist	GEN01	
Marisa Miodosky	Social Scientist		
Carter J. Brandon	Lead Economist	GENGE	
Reynaldo F. Pastor	Chief Counsel	LEGLE	
Simon Milward	Junior Professional Associate		
Jeannette Ramirez	Operations Officer	LCSAR	
Enos Esikuri	Sr. Environmental Specialist	LCSEN	
Jimena Garrote	Counsel	LEGLA	
Maria Emilia	Sparks Team Assistant		
Edgardo Floto	Sr. Agricultural Economist Consultant	LCSAR	
Alberto Yanosky	Consultant		
Supervision/ICR			
Ruth Tiffer-Sotomayor	TTL Sr. Environmental Specialist	GEN04	
Veronica Jarrin	Operations Analyst	GEN04	
Pablo Francisco Herrera	Co-TTL and Environmental Specialist	GEN04	
Gustavo Adrian Canu	Procurement Specialist	GG004	
Luz Maria Meyer	Financial Management Specialist	GG022	
German Nicolas Freire	Social Development Specialist	GSU04	
Gunnar Fabian Gotz	Economist, Consultant	GEN04	
Klas Sander	Senior Environmental Economist	GEN04	
Jeannette Ramirez	Operations Officer	GEN04	
Maria Pia Cravero	Counsel	LEGLE	
Veronica Jarrin	Operations Analyst	GEN04	
Geise Santos	Program Assistant	GEN04	
Rosa Arestivo	Program Assistant	LCC7C	

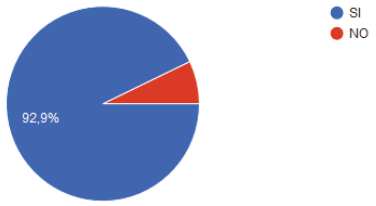
(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD thousands (including travel and consultant costs)
Lending		
FY05	2.46	8.04
FY06	24.55	82.17

FY07	5.98	44.00
FY08	18.98	75.22
FY09	2.59	10.43
FY10	4.23	10.05
Total:	58.79	229.91
Supervision/ICR		
FY12	10.62	15.86
FY13	11.56	25.39
FY14	18.80	46.04
FY15	7.77	69.68
FY16	3.92	20.59
FY17	0.38	11.06
Total:	53.05	188.62
Grand Total:	111.84	418.53

Annex 5. Beneficiary Survey Results

1. Do you consider that the 'Paraguay Biodiversidad Project' has contributed to improving land-use practices in the corridor?



Responses: Yes: 92.9%, No: 7.1%, n = 100.

- The beneficiaries consulted agreed that the project implemented activities that have improved their land management thanks to continuous training and technical assistance received by project.
- It is also highlighted that the time used for these activities was sufficient.
- It is hoped that the Paraguay Biodiversidad Project will continue in order to reinforce the technical training and to follow-up on the different subprojects that were implemented. Otherwise, the desired impact in the environment will not be achieved.

2. Did the project generate benefits in your community/institution?

- It has generated greater empowerment of local communities and a specialized organized ethnic work with the Indigenous Peoples (IP).
- Greater collaboration was achieved among State Institutions, ITAIPU Binacional, NGOS, Social and Indigenous organizations that have contributed to the achievement of objectives pursued by the project in significant ways.
- The methodology of better productive organization was implemented while at the same time respecting our Mother Nature.
- Very good transfer of knowledge under development and implementation of projects was achieved.

3. What did the project do right?

- Involving IP allowed them to take conscience and fight for their rights on their own lands.
- The project respected and took into account the international and national norms on IP, and was conducted step-by-step, as designed on paper. Previous projects were top–down, and began and ended without the Indigenous People's knowledge. In this project, the IP designed their own subprojects.
- Through this project, IP are being empowered, raising agro-ecological awareness and teaching the value of their lands.
- The indigenous culture is being revalued. Certain discrimination always exists toward IP. The importance of this project was the transfer of knowledge without the loss of culture or local dynamics.
- All subprojects implemented were in accordance with the needs and culture of the IP.

4. What did the project do wrong?

- The organizations agreed to highlight that the disbursement of funds were not made on time and this affected the planned activities.
- Planting of trees sometimes did not match the season and time to coordinate with the beneficiaries took extra time due to access issues, bad conditions of roads, and so forth.
- A lack of flexibility of the disbursements with regard to the budgets delivered to the organizations. Execution times vary according to the presentation of the budgets. In many cases the market prices of merchandise varies at the moment of effective purchase, nevertheless the executing unit does not allow for this variation in prices.

5. What recommendations would you make to the project in order to assure the sustainability in the future of the investments made?

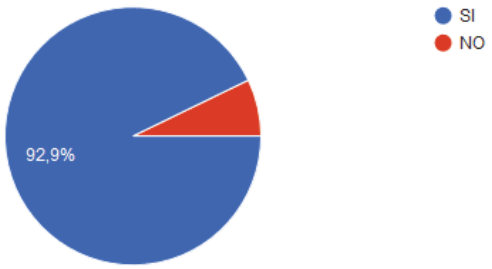
- More time to implement the projects.
- More funds to execute the projects.
- Strengthen work among institutions and organizations involved in the project.
- Oversight of all implemented subprojects.
- Greater technical and financial assistance for project execution.
- Continue to develop projects oriented toward the restoration of the Alto Paraná Atlantic Forest and biodiversity conservation with the active participation of those who inhabit the area.

6. How can your institution help or participate more in the conservation of the Atlantic Forest?

- Training, transferring nontraditional knowledge on forest enrichment with yerba mate, fruit trees, native trees, and medicinal plants.
- Raising awareness and involving youth with the guidance of the Iguazu technicians and community agricultural promoters.
- Safeguarding traditional knowledge of each IP.
- Replicating activities developed under the Paraguay Bio Project in new subprojects.

Annex 6. Stakeholder Workshop Report and Results (n = 100)
(if any)

A6.1 Survey of Local Inhabitants–Contributions of the Paraguay Biodiversity Project Regarding the Restoration of the BAAPA in the Affected Areas



92.9% of people interviewed said that the project contributed to the restoration of the Upper Paraná Atlantic Forest and the conservation of Biodiversity through the implementation of biological corridors. The project involves the population within the corridor in sustainable production, and helps them to have economic incentives. People interviewed point out that the opportunity to plant native trees, and create awareness of the farm owner is a fundamental task that must be carried out, since this contributes to the conservation of the environment in the short and medium term.

In addition, having the basic knowledge about the need to conserve forests to balance productivity is a key tool for changing attitudes towards this difficulty, which affects not only the area directly involved but also the whole country. People interviewed also emphasize that through the project, we could count on highly qualified specialists—national and international—on this topic, who contributed to the discussion and implementation of more effective intervention strategies.

The project also provided the opportunity to access knowledge in the most remote communities within the corridor, and to implant native plants in dismantled places. Producers showed their interest in caring for the planted species, and this guarantees the growth of the species. This will contribute to improving the region's forest cover. The interviewees said that this type of systematic intervention facilitates the arrival of more producers, encouraging responsible production, care for biodiversity and restoration of the Atlantic Forest of the Upper Paraná.

The project has achieved a high percentage of achievement of objectives, planting millions of trees and generating sustainable businesses that ensure the care and conservation of biodiversity by beneficiaries.

Paraguay Biodiversity contributes to the restoration of the Atlantic forest of the Upper Paraná. The native plants planted will again supply large amounts of oxygen to our region, which is currently very badly, and treated by large extensions mechanized for agricultural production.

A6.2 Benefits Generated in Institutions

Through the project, it was possible to: i) to establish close contact with the producer through a fluid and friendly communication; ii) to raise awareness of the need for preservation of springs, streams and road protection; iii) to attend systematic trainings directed at technicians and producers in financial and technical aspects that respond to the local reality.

It also highlights the experience in working with projects that aim at improving biodiversity. The experience of executing the subprojects allowed the acquisition of new skills, the need for close relationships with local institutions and producers, and strengthening administrative capacities.

On the other hand, the interviewees mentioned that this work allowed them to(i) bring sustainable production ideas to maturation;(ii) learn new methods of negotiation with beneficiaries;(iii) strengthen teamwork; and (iv) work with different communities to improve their quality of life, taking into account criteria of conservation and restoration of the environment.

Particularly for small producers, this project generates great expectations and hope through the production of yerba mate and honey, without losing sight of the criteria of protection of the environment and generation of new healthier ways of life for their children. These are social and economic benefits at the same time, since it allows the opening of markets. Producers have sharply increased their interest/knowledge to protect the environment, finding that restoration through biological corridors is possible.

Finally, they emphasize the role of cooperatives at the local level, since their permanent support has a positive impact on each producer.

A6.3 Strengths of the Project

The interviewees cited as additional outstanding strengths(i) producers' awareness of the importance of biodiversity corridors; (ii) recovery of springs and streams; (iii) generation of local labor resources; and (iv) systematic PIU and zonal technique support. It was also emphasized the project credibility achieved locally, especially in those places were citizens are very deceived by other institutions. The participants emphasized the transparency and seriousness of this project, the good predisposition of the beneficiaries and interest in the conservation of the environment with a perspective of production and food security.

Furthermore, it was mentioned the good predisposition of technicians of the Paraguay Biodiversity's PIU (Project Implementation Unit) and its permanent presence in the field. This team was able to analyze each of the negative situations/problems on a permanent way and to propose quick and effective solutions.

A6.4 Weaknesses of the Project

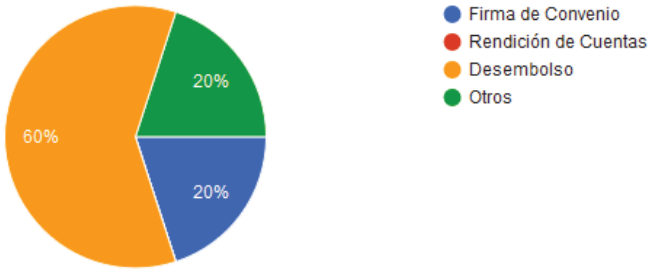
Some interviewees stated that some weaknesses evidenced by the project were: i) need of better planning activities in advance, considering local agriculture calendars; ii) the technical specifications for some activities to be implemented in the community were very general,

which required investing more time in consultation to the PIU; iii) development of agreements with regional implementing agencies required a large volume of documentation; iv) it took too much time the review and the approval of agreements by the PIU.

Other participants indicated that a greater promotion of the project could have achieved greater impacts, but recognized that the corridor is a very large area. They also mentioned that local suppliers' are limited and deficient (i.e. photocopies), which makes it difficult to deliver the requested documentation for accountability in a timely manner. This weakness negatively affects the continuity of the pre-established disbursement schedule.

The application of contracting rules from the Bank has bureaucratic mechanisms that sometimes delay the processes. Another element to consider is the relation of times of disbursement/planting season, since sometimes these were difficult to coincide. Fortunately, the techniques used (fertilization and hydration chemicals) by the project were very successful in most of the planting areas.

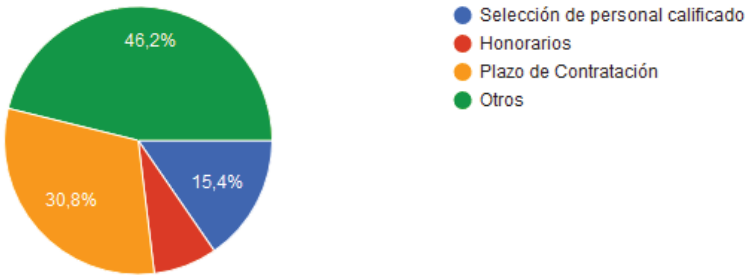
A6.5 Difficulties in the Project's Administrative Process



The 60% of interviewees mentioned that the greatest difficulty in the administrative process during project execution was the disbursement time. The disbursement delay caused a time of waiting in the execution of the subproject, which did not help to complete activities in the proposed timeframe.

The 20%of interviewees said that the difficulty was in the signing of agreement, noting that in several cases the time elapsed since the delivery of documents for the agreement and signing by Paraguay Biodiversity was approximately 5 months. The remaining 20% were on difficulties in accountability. No mayor problems were found on financial reporting.

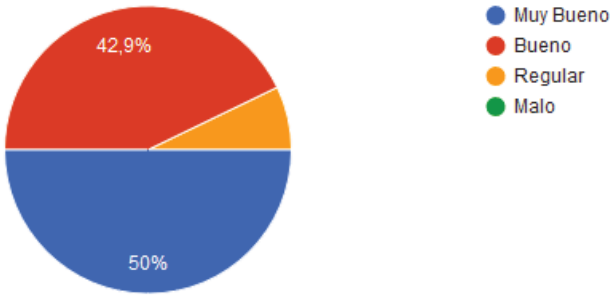
A6.6 Difficulty in Hiring Technicians for the Project



30.8% of interviewees from the regional implementing agencies stated that one of the biggest difficulties in the process of hiring the technician for the project was the deadlines. The requirement for hiring by norms of the PIU such as the publication on web pages for those areas far from the reaches of any technology are still difficult barriers for the rural sector.

15.4% stated that the difficulty was in the selection of qualified personnel, since the contract for the project was short; the available technicians were scarce and they always intended to continue working with greater stability or to extend their contract. On a smaller scale, the problem mentioned by the respondents was the amount of the fees.

A6.7 Activities Carried Out with the Subprojects that Contributed to the Achievement of the Objective.

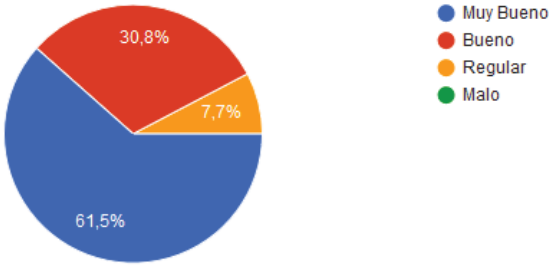


It is noteworthy that 50% of the population interviewed stated that the activities carried out by the subprojects have been very good and contributed to the achievement of the project's objectives. The proposed approach highlights the conservation of forests and preservation of the environment. Likewise, they indicate that the beneficiary population considers that actions promoted by the project contribute to the family economy and the conservation of biodiversity through the increase of forest cover.

42.9% said that project actions have been good, noting that these have been appropriate in the area of restoration. The activities were in line with the reality of each context, as one performs the required steps, these activities become a little easier.

Less than 8% rated the project as “regular” or “bad” because of the view that sustainability cannot be guaranteed if a follow-up phase with a long-term vision is not guaranteed. They argued that assistance to beneficiaries participating in the project should be longer-term.

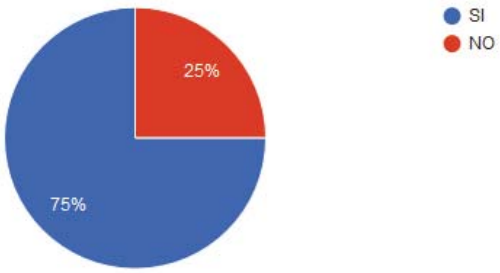
A6.8 Evaluation of the Trainings Carried Out within the Subprojects



61.5% of the interviewees rated the training performed within the subprojects as very good. They indicated that the training activities were carried out in a timely manner, highlighting the relevance of the topics to the subprojects’ execution. Interviewees highlighted the training and adequacy of the trainers, along with the trainings’ good techniques (appropriate methodology) for reaching beneficiaries.

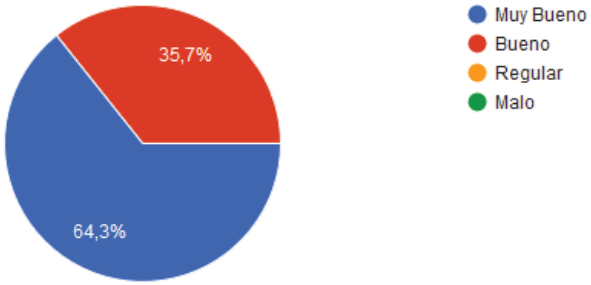
30.8% of the interviewees said that the training was good and enriching for both beneficiaries and technicians. The concept application technique in practice helped to achieve more learning that was more meaningful. All training topics were useful for the execution of the activities, considering the awareness and knowledge gained. Trainings help beneficiaries learn how to apply environmental techniques (integrated pest management) that are unknown to them, the same also help improved the production profitability.

A6.9 Compliance with Project Administrative Deadlines



75% of the interviewees stated that the project's administrative deadlines have been met. The remaining 25% argued that the administrative deadlines have not been met considering that an extension had to be made. The work was arduous but they were finally fulfilled in their totality.

A6.10 Evaluation of the PIU’s (Project Implementation Unit’s) Technical Support to Its Regional Co-Implementing Agency

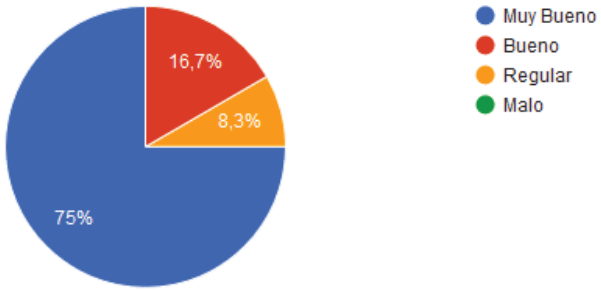


64.3% of the interviewees stated that the technical support provided by the PIU to regional co-implementing agencies was very good; they emphasized the good predisposition to accompany the project through to its execution and the constant support in the field.

Interventions were made in a timely manner; HRs are ideally suited to face any emerging situation, proposing practical solutions to each problem.

35.7% said that the accompanying technical support was good, emphasizing that the systematic assistance in the field.

A6.11 Evaluation of the PIU's Administrative Support to Regional Co-Implementing Agencies



The graphic shows that 75% of respondents said that the administrative support of the PIU has been very good, since despite the short time to execute the project, the direct communication to clarify doubts was fundamental, as well as the training and permanent advice for procedures and accountability.

16.7% stated that the administrative support was good, noting the availability of a permanent contact mechanism to resolve concerns, and noting that administrative processes are facilitated in a timely manner.

The remaining 8.3% stated that the administrative support was regular.

A6.12 Weaknesses of Regional Co-Implementing Agencies in the Field Work

The regional co-implementing agencies interviewed indicated that the weaknesses experienced in the fieldwork were initially due to (i) lack of a staff structure, (ii) lack of available materials

to implement the project (locally), (iii) beneficiaries' initial low interest and (ii) poor road conditions due to rains which consequently delayed activities.

Finally, the weaknesses were largely overcome by the strong coordination work of the PIU and the regional co-implementing agencies and the interest of the beneficiaries.

A6.13 Weaknesses Found in the Administrative Process of the Regional Co-Implementing Agencies

The weaknesses presented by the regional co-implementing agencies in the administrative part are (i) poor knowledge regarding the project and people available to execute, (ii) ignorance of contracting and adjudication mechanisms, (iii) difficulty in understanding some forms, and (iv) differences between the budgeted and the purchase invoices.

A6.14 Lessons Learned

Highlighted lessons learned from the interviewed participants include: (i) the need to plan activities with more time; (ii) identify local suppliers who respond in a timely manner; (iii) the need of training of regional staff to carry out the project; and (iv) the need to maintain a close relationship/communication with communities.

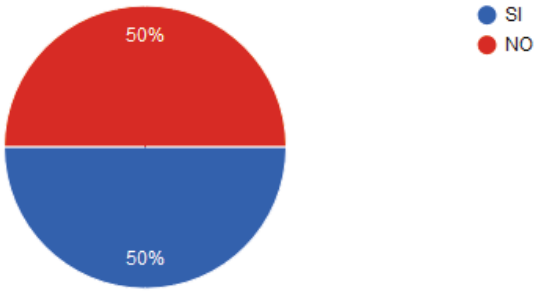
It was also emphasized that the administration of resources with the modality of regional co-implementing agency was the most effective way to implement a project like the Paraguay Bio. All agreed that projects including environmental sustainability supported the improvement of quality of life and nature. Project participation and the alliance between the project, PIU, and beneficiaries increased the possibility of achieving objectives.

A6.15 Recommendations of the Regional Co-Implementing Agencies to the Project to Ensure the Future Sustainability of the Investments Made.

The recommendations made were (i) disseminate information regarding the importance of the project to producers; (ii) provide longer-term follow-up of technical assistance and an economic projection of activities and investments (for example, yerba mate, apiculture, and forests); (iii) improve the coordination of agricultural and administrative schedules; and (iv) analyze other participation strategies with medium and large producers to advance towards the goal of installing the "Biological Corridor".

It was also mentioned the importance of creating value chains to commercialize the production and the development of business plans with the groups, and the importance of articulating with local and national initiatives having common or similar objectives.

A6.16 Project Funds' Scope for the Implementation of agreements

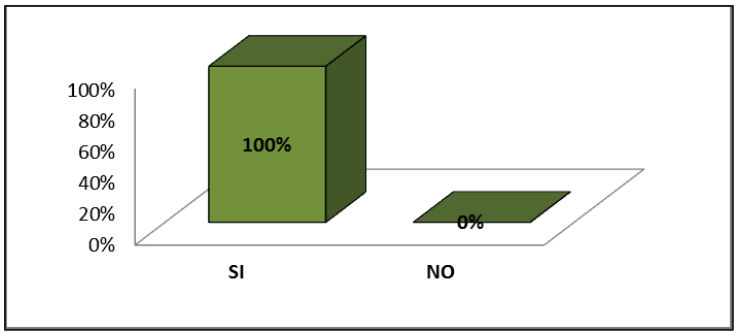


50% of respondents affirmed that the funds have been sufficient to carry out the actions planned under the project, per the approved work plan.

On the other hand, the remaining 50% stated that it is necessary to adjust the funding amounts, since in some cases the resources are not enough to purchase all the necessary inputs.

A6.17 Indigenous Regional Co-Implementing Agencies (*Ejecutoras Indígenas*)

A6.17.1 Do you consider that the Paraguay Biodiversity Project contributed to the restoration of the Atlantic forest of the Upper Paraná and the conservation of biodiversity?



100% of the regional co-implementing agencies for indigenous communities stated that the project has contributed to the restoration of the Atlantic Forest of Upper Paraná and to the conservation of biodiversity. Each indigenous community has its own characteristics, which is why the evaluations of each regional co-implementing agencies justify differently their response. The analysis of each indigenous regional co-implementing agency is detailed below:
Itapúa – Tekoha Guasú San Rafael

This group stated that, from the point of view of restoration, the project has collaborated at the community level with the definition of areas for forest enrichment and natural regeneration, which clearly shows a very positive contribution, although the most important collaboration of the project is in the conservation of forests.

PyBio has facilitated different spaces for discussion and increased conservation practices. At the same time, it facilitated workshops, leaving installed capacity in the HR, either in the regional co-implementing agency or at the community level, which directly collaborate with the restoration and conservation of biodiversity.

Canindeyú Cultural Popular Association

According to statements by this regional co-implementing agency, the project contributed to the restoration of forests with native species. Subprojects played an important role, as the activities implemented were of paramount importance for the restoration of forests.

They emphasize that through the plantations of native species, yerba mate and fruit trees, progress could be made with the restoration and conservation of the forest. It is key to raise awareness of this action, especially around houses, schools, by planting fruit trees. They also commented that while it is a long-term job, it requires support and patience. During the process, there were several difficulties, for example: waiting times for disbursement, in some communities, seedlings were planted out of season, but in spite of that fact, the effort and enthusiasm of the members of the communities prevailed and the proposed objectives were achieved.

Aché – Puerto Barra Community

For the Aché – Puerto Barra community, the Paraguay Biodiversity project made a significant contribution to the restoration of the Atlantic Forest, since today they are viewing the forest in the process of restoration in each department of the country, thus beginning the long road to recovering Biodiversity. For the Aché community, biodiversity conservation is very important because for them the forest is life.

Likewise, through the plantations of different native forest species, especially with yerba mate and fruit trees interspersed with each other, the process of reforestation is initiated, as well as providing fruits to the communities surrounding the project, and it promotes the appearance and feeding of different species of our wild fauna.

Ybyturuzu Yby Marane'y Association– *Dirección independencia Departamento Guairá*

In this last evaluation carried out, this regional co-implementing agency also agrees that the project positively contributed to the restoration of the Forest. It considers that the contribution of Paraguay Biodiversity goes beyond its objectives; nowadays it constitutes the cornerstone for the restoration of the Atlantic forest and the conservation of biodiversity. Today, this project is recognized as a credible institutional entity; Which, on the one hand, fulfills its own social responsibility in favor of the environment and biodiversity and on the other hand, to be the coordinator and controller of the international contributions given to Paraguay, for example: the SEAM (Environment Secretary of Paraguay), as an inspection body and a control entity for all protected areas, which is a very weak institution to counteract the scourges of deforestation.

They emphasize that ITAIPU Binacional, through the management and technical team of the Paraguay Biodiversity Project, provided suitable human resources, promoting the capitalization of knowledge in local personnel.

The Association celebrates the mitigation activities being carried out by ITAIPU, as well as the support received by the international entities that are part of this initiative. The Association is ready to continue contributing in this line of work where transparency is emphasized based on sustainable actions.

CETEC – Indigenous communities of Tavai

Forest species and yerba mate were introduced in the forests of indigenous communities and native forest management was initiated in the participating communities.

It contributed to strengthening the value of the forest for indigenous communities and increasing the affirmation of indigenous cultures and their relationship with the forest.

The opportunity was created for the improvement of indigenous communities according to their culture different from the quality of life issues.

Additionally, it contributed to the increase of fruit species, yerba mate, and self-consumption cultivation.

Ava Guaraní – Ñande Ru Simeón DelgadoProducers Association

They emphasized that the project not only contributed to the restoration of the forest but also to the greater organizational empowerment of the indigenous association. They emphasize that the project aroused interest and awareness in strengthening the organization with members of the indigenous community itself.

Oguasu

Thanks to this project, it was possible to work to raise awareness of restoring forests, but at the same time, it was an opportunity to bring the organization closer to the ITAIPU projects and meet other regional co-implementing agencies working with indigenous communities. Peer feedback strengthens knowledge and broadens other horizons.

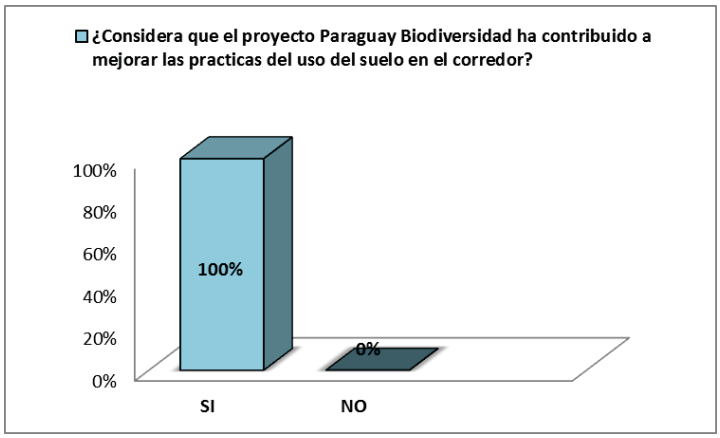
A6.17.2. What benefits did the project generate in your institution?

All agreed that the project has been a cradle of opportunities. The respondents emphasized that, through its implementation local benefits were generated, including continuous training (agroforestry, legal framework, pest management, and so forth); employment generation and investments on the plantation of native species, yerba mate, fruit trees, and also for apiculture,

Building awareness of the need to conserve and connect forests in our region is one of the most important achievements. Likewise, (i) it strengthened the knowledge of other communities and

groups of people where this type of work was not done, and (ii) it strengthened projects previously developed with other international agreements.

A6.17.3 Do you consider that the Paraguay Biodiversity project has contributed to improving land-use practices in the corridor?



100% of the regional co-implementing agencies of the indigenous communities mentioned that the Paraguay Biodiversity project has contributed to improve land-use practices, teaching good practices through talks about land use, and planting fruit trees and yerba mate.

Several interviewees said that the collaboration has been indirect, since the proposed production systems are mostly practices that seek to be more environmentally friendly when implementing forest plantations, and helping to improve land-use practices.

Respondents emphasized the interest of the project on the use of the soil without damaging it. One of the alternatives of subproject that marked the difference was the planting of seedlings (yerba mate) under bush without distorting the forest, the diversified practice between the production of self-consumption and seedlings.

Other land use practices or subproject that were of most interest to the IP, include: (i) use of ranches for the production of agricultural products for self-consumption with an agro-ecological approach (without burning); (ii) installation of apiculture boxes for the production of honey; (iii) use of medicinal plants to produce home remedies; and (iv) the tourism incentive.

The incorporation of the efficient use of green manure, creation of seed banks and distribution of seeds to communities could complement existing actions.

A6.17.4 What did the project do well?

The interviewees state that the project highlighted in several actions, mainly on the respect to the culture and the right of the IP, fundamental pillar for the actions with this population.

Likewise, they emphasize that all subprojects implemented were in accordance with the needs of IP, encouraging the transmission of knowledge and the revaluation of their culture.

The project recognized and claimed rights favorable to IP at national and international level, by using free and informed prior consultation, thus achieving that the subprojects were elaborated in a participatory way with the communities, prioritizing their needs and respecting their requirements.

The opportunity to involve indigenous organizations as regional co-implementing agencies is highlighted. This exercise allowed to install a valid alternative for the own management of the beneficiary community. In this process, the work of the whole community was visualized: men, young people and women. This work allowed introducing technical tools to improve the production, for example to introduce the plantings under the bush, to keep seeds for the next harvest, among others.

A6.17.5. What did the project do wrong?

On the other hand, the interviewees state that there are important points that need to be improved, such as: i) accelerate payment; ii) improve coordination of planting with local calendar; iii) the deadlines for implementing the projects were short, and; iv) excess paper work and evidence of project implementation.

Executors emphasize the need to make the budget more flexible, and the need to understand that the indigenous community have a particular rhythm of work and often does not coincide with technical or administrative times.

A6.17.6 What recommendations would you give to the project to ensure the future sustainability of the investments made?

The most important recommendations to ensure the sustainability of the investments mentioned by the indigenous regional co-implementing agencies were (i) the need to envision longer times of at least two or three years to execute the project, in order to visualize the production and growth of the trees; (ii) working with communities including all nuclei and family classes, not only with associations, since they do not represent the whole and create unnecessary fragmentation; and (iii) it is fundamental to provide continuity and systematic follow-up to obtain the desired results.

It is essential that technicians, inspectors and evaluators know the culture of IP, and they have knowledge of customs and daily activities.

Considering the workshops/trainings, it is important to keep in mind that indigenous communities have oral cultures, so theoretical frameworks should be simple emphasizing rather the practice.

A6.17.7How can your institution help or participate more in the conservation on the Atlantic Forest?

All indigenous regional co-implementing agencies agreed that systematic awareness regarding importance of biological corridors is a key. Our forests need to be restored, but with native plants and fruits leaving exotic plants aside.

We are currently working with the orientation of conserving and restoring forests, maintaining their culture and the environment as established in the laws.

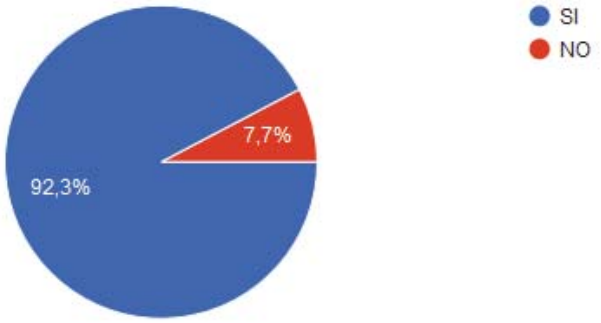
At the center of local training, agroforestry courses are currently being replicated in presentations to agricultural promoters in the community. Likewise, we work in the reforestation of common spaces in the communities involving young people with the accompaniment of technicians and agricultural promoters.

The regional co-implementing agencies are convinced that progress will increase with training, transferring nontraditional knowledge on forest enrichment, and with yerba mate, native fruit trees, native timber, and medicinal herbs.

These respondents also suggested (i) the gradual creation of small subprojects to add value to products, (ii) the value of culture in tourism, (iii) the strengthening of apiculture (research), (iv) work on reforestation, and (v) the use of natural resources in artisan production.

A6.18 Environment Secretary (SEAM)

A6.18.1 Do you consider that the Paraguay Biodiversity project contributed to the restoration of the Upper Paraná Atlantic Forest and the conservation of biodiversity?



92.3% of the interviewees who are part of the SEAM team consider that the project has contributed to the restoration of the Upper Paraná Atlantic Forest, and that the project has contributed to the strengthening of local and institutional capacities

They emphasized that the projects carried out and the results achieved not only met the conservation goals but also met the restoration goals, which contributed significantly to the proposed objective.

They also emphasized that, through the actions of the project, it was possible to (i) restore wild protected areas and support the enforcement institutions; and (ii) identify and diagnose the sub-corridors, allowing the establishment of a baseline, objectives, and goals in order to correct and/or strengthen the weaknesses in the restoration.

They mentioned that, through the actions of the project, it was possible to consolidate the baseline of the ASP's management aspects, as water and forest, which provide information of pilot statistics on sustainable production. The information gathered allows decision making for the conservation of natural resources and contributes to continue actions and initiatives that provide information essential to identify problems and their solution.

A6.18.2What benefits did the project generate in your institution?

The interviewees commented that the benefits generated by the project were many, including (i) biological monitoring of ecosystems in the area; (ii) construction of infrastructure that responds to the requirements of park rangers in the Ñacunday National Park; (ii) improved infrastructure in SEAM's headquarters; (iii) creation of new private protected areas; (iv) provision of vehicles; (v) continuing training for this institution's thereby achieving technical strengthening; (vi) technical proposals prepared by specialists for creation of the environmental fund and generic environmental management plans (PGAGs, in Spanish), among others; and (vii) preparation of the management plans for Ñacunday and Ybyturuzu.

A6.18.3What were the learning's?

As in any project, it has achieved important learning such as: i) involvement of national and local government sectors; ii) permanent participation of citizens in general including indigenous communities.

The project gave the opportunity to have the current information about the reality of the state of UPAF and to generate necessary baselines for future projects for the conservation and restoration of this. It made possible to train HR on the identification of the potential environmental impacts of the activities foreseen in the PGAGs. Likewise, the project provided timely information for decision making based on the articulation of the public, municipal, and private sector, and NGOs. The participation of municipalities is fundamental to achieving sustainable development and conservation. Finally, it highlights social work and integration with the owners and communities achieved within the framework of the project, in order to connect the wooded areas.

A6.18.4. Strengths and weaknesses that you could observe during the project execution.

Project strengths mentioned by the interviewees include (i) consolidation of institutional capacities; (ii) generation of information to strengthen the establishment of public policies and decision making for SEAM; (iii) permanent participation of the inhabitants on, and transfer of technologies to, the pathway created to continue advancing towards the project's vision; and (iv) professional capacity of the project, PIU, and staff

Project weaknesses mentioned were (i) the need for greater involvement of institutions, especially executing institutions; (ii) climatic factors cause delays and affect fulfillment of project objectives; (iii) changes of authorities during the project implementation period have a significant impact and led to difficulties in communication between the SEAM – PIU parties; and (iv) bureaucracy of the different institutions.

A6.18.5How to continue promoting biological connectivity between protected areas and strengthening them?

The interviewees proposed concrete actions to continue the work carried out, such as (i) conduct environmental monitoring, follow up on actions already implemented and promote local governance; (ii) train municipalities involved geographically in biological corridors; (iii) promote mechanisms to disseminate the importance of biodiversity and the benefits of maintaining it; and (iv) encourage the creation and effective implementation of the environmental fund.

A6.18.6 How can your institution collaborate in the conservation of the Upper Paraná Atlantic Forest?

The SEAM can collaborate with several actions, highlighting(i) establishment of the legal term "biological corridors" within the legal system by means of a decree or law for the purpose of establishing the legal framework; (ii) training sectoral guilds and municipal institutions; (iii) strengthening biological monitoring and satellite monitoring; (iv) enforcement and awareness-raising of property owners through continued and sustained support for initiatives of this nature; and (v) granting the certification of forest land by Law No. 3001/06.

A6.18.7. What recommendations would you give to the project to ensure the future sustainability of the investments made?

The recommendations suggested by the SEAM to ensure the sustainability of the investments made are (i) control and follow up of commitments already made; (ii) analyze the possibility of project continuity over a longer period of time;(iii) carry out monitoring to ensure sustainable development for the beneficiaries; and (iv) promote the creation of a consumer market, marketing, transport, and credit and logistic facilities to enable owners and producers to increase their revenues based on more-effective marketing of the products obtained. Specifically, with respect to protected areas, monitoring and follow-up are required, and it is very important to ensure "financial sustainability" for maintaining current investments.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

December 29, 2016

Mrs. Ruth Tiffer Sotomayor
Project Team Leader
World Bank

Ref. Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay Biodiversidad –TF 096758

We have received and reviewed the Implementation Completion and Results Report (ICR0003922) of the Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Eastern Paraguay Biodiversidad (TF 096758), with non-reimbursable resources from the Global Environmental Facility (GEF) in the amount of $4,5 million, granted to ITAIPU Binacional, and the World Bank as the implementation agency.

As executing entity and co-executing the project respectively, ITAIPU Binational and Secretary of Environment (SEAM), as well as the Ministry of Agriculture and Livestock (MAG), through the Sustainable Rural Development Project (PRODERS), we express an enormous satisfaction of having successfully concluded the implementation of the project in the proposed corridor area, benefiting farmers and indigenous communities. Based on the results obtained in the implementation of this project, we consider appropriate a Satisfactory rating for the achievement of the PDO.

The Project had a total duration of 72 months with a total effective counterpart of US$ 14,151,436.33, having superseded the projected co-financing by 8%. The effective initiation of UEP functioning was in February 2013, resulting in an important delay of effective initiation.

In April of 2013, Presidential and Congressional elections were held. Mr. Horacio Cartes was the winner and is the current President of the Republic. A period of transition was declared during which no decisions were taken until August 15th, on which the new government assumed power. As soon as the new authorities were installed, Project activities were resumed in October of 2013. The new authorities, faced with low execution of the project, requested a 24-month extension from the World Bank, which was granted in January of 2014.

Both ITAIPU and SEAM, have pursued arrangements aimed at achieving institutional arrangements to make the execution of the project possible. The Steering Committee and the Technical Advisor Committee were created.

ANALYSIS OF THE RESULTS FRAMEWORK

The Paraguay Biodiversidad Project was characterized by a long planning period and extended execution period. The PAD (Project Appraisal Document) context was developed in 2007, taking this into account, some aspects changed radically during the effective execution period (2013). ITAIPU Binacional had the conditions to provide technical oversight regarding the project´s activities; however, institutional coordination with SEAM and MAG to effectively move project activities forward was challenging at the beginning.

The project was restructured on July 1, 2014. Some changes were proposed during the Midterm Mission with regard to the project indicators. No conceptual change to the PDOs was proposed. The main changes were based principally on the short time frame for the execution of the project, including: (i) adjust the goals of the results indicators in order to simplify design and to assure the achievement of the development objective of the project during the remaining time for project implementation; (ii) exclude some indicators and adjust others in order to simplify monitoring; (iii) contribute to the institutional strengthening of SEAM by updating the list of technical assistance studies to be undertaken; (iv) Broaden the Technical Advisory Committee to incorporate INDI as a permanent member; (v) take advantage of the eventual expansion of working area of PRODERS toward other Departments in order to utilize the resources designated for the implementation of MRN and sustainable agricultural practices at the production unit level, in order to drive practices aimed at biodiversity conservation beyond the Department of Caaguazú, (vi) incorporate the acquisition of consulting services to be accomplished with ITAIPU´s own resources as project co-financing.
This proposal for the restructuring did not alter the project's development objectives.

Institutional Arrangements. The composition of the project's steering committee was modified to include The Paraguayan Institute for Indigenous Persons (INDI) as a permanent member. INDI actively supported the planned activities for the Indigenous component. PRODERS had also planned to broaden its scope of action through the extension of time and funds (P148504).

A7 .1 Key Factors that Affected Implementation and Results

A7.1.a Project preparation, design, and initial quality

The period between project preparation and its effective execution was very long, unleashing a series of political-institutional factors that affected the development of the project. Between design and implementation, a lack of detailed description of the proposed indicators was noted, especially in components 1 and 2. This was also observed in the difficulty of establishing the intermediate products for each component.

– Another relevant point was the need for the project and its counterpart from MAG, the PRODERS project, to be implemented simultaneously. This point was realized with much difficulty owing mainly to the different alternate periods for execution of this project and PRODERS.

– The contracting of the Concurrent Financial Auditing was declared void on the first occasion due to the nonexistence of companies with the requested specific experience in the country, which resulted in the delay of disbursements for executing field subprojects.

– *Hectares affected by the subprojects:* according to the goals established in number of subprojects and number of hectares, a baseline of 150 ha/subproject was estimated. This represented a very high figure, since during the execution of the project, small-scale producers (≥ 20 hectares) were the principal beneficiaries.

– *Investment by subproject:* the estimated costs for the execution for the restoration subprojects were reviewed, considering very inferior values in order to reach the goals in terms of quantity and area planned.

– *Hectares of restored forest:* in order to define this indicator, what was established in the PAD was used, in its footnote N° 2, Par. 25, which states: *"These target areas include native forest that are still ecologically viable to ensure biodiversity conservation, sustainable management or restoration"*.

Based on this definition, all the conservation, sustainable forest management, and restoration were considered (Community Subprojects I).

– *Micro basins:* the PAD presented contradictions regarding the number of micro basins to be planned, mentioning 25 in one section and 75 in another. The time required to achieve the goals of this activity, and the need for its implementation simultaneously with the execution of subprojects in order to comply with the PDO indicators, was discussed.

The principal problem for the execution of Component 2 stemmed from the lack of a clear definition of its baseline. That baseline included a larger amount of protected areas than existed on the ground, and it did not mention the inclusion of existing private reserves in the goal of protected hectares under private reserves. The baseline included Ybytyruzú RRM, and the Reserve area for San Rafael National Park as effective protected areas, when in reality, both were "Paper Parks." It was estimated before the project's start that San Rafael would have its management plan under implementation because of the GEF Project, Paraguay Silvestre.

Indigenous Strategy: The Indigenous Strategy was an important learning process within the project framework. It was observed that the IP were the principal owners of forest remnants that are not part of the protected areas. The strategy was relevant for the incorporation of INDI as a part of the project's governance scheme.

Although the project was aimed at strengthening public policies favorable to forest conservation, Component 3 did not contain a very precise definition of its baseline. This complicated the possibility of defining "institutional strength" for MAG and SEAM, especially due to the very complex institutional structure.

A7.1.b Other design aspects that affected project development

– *Execution Period*: the planned Execution Period was not in accordance with the principal objective to "establish biological connectivity through the Mbaracayú – San Rafael Corridor". Restoration periods are long, as has been demonstrated by similar experiences. The "Santa María Corridor," in the reservoir zone of the Left Bank of ITAIPU, achieved physical connectivity (15 km) in the reservoir zone with the Iguaçu National Park, through offers to owners and mechanisms for economic compensation, during a period of **10 years of execution**. Nevertheless, these corridors are currently not yet very effective, and work is being conducted on monitoring and management in order to undertake complementary actions to improve the functionality of the corridors.

– ***Lack of adequate stratification of subprojects:*** the project design assumed that the execution of subprojects would be uniform for the different stakeholders. Stakeholders involved presented great heterogeneity, four Indigenous Peoples with important cultural differences (Ache, Mbya Guarani, Ava Guarani, and Pai Tavytera), small-scale Paraguayan farmers, Brazilians, European and Asian farmers, individuals and production cooperatives, and large landholders. This heterogeneity led to adjustments in the manner of executing the subprojects in each sector.

A7.1.c Implementation

– *Agricultural calendar and climate factors*: A great inconvenience from reducing the project's effective execution period to only two years was the agricultural calendar. Many of the subprojects (crops) depended on seasons and periods of the year that had already passed at the time of execution.

In spite of the fact that the years 2014 and 2015 were very humid (rainy), many subprojects were implemented outside of their ideal agricultural calendar.

– Planned micro-basin. The initial implementation strategy was based on a vision of planned micro-basins, and later implementation through the subprojects. Due to the lack of execution time, it was decided that both activities would be implemented simultaneously, in a related manner. The subproject beneficiaries participated in the planning process for their micro-basins. One reason to establish this action policy was that a precise definition of "micro-basin" was lacking, especially with regard to the approximate scale and the definition of "micro-basin".

–Local Implementing Agencies. The selection of executing organizations was difficult because, in many cases, the organizations preferred by the indigenous groups were unable to comply with the minimum administrative/financial requirements.

– **In the case of Component 2**, the principal problems associated with implementation came from the small number of offers with experience with the development of very specialized activities, such as the case of "development of environmental management plans"; to comply with the minimum number of firms (6) required for making a short list. In all cases, invitations to consulting firms had to be reiterated in order to prepare a short list of firms.

– Teams. Another difficulty identified was the high turn-over rate of technical personnel, both in the UEP, and in the other institutions (MAG; SEAM), or as changes in the WB. All of this translated into greater time requirements for the execution of actions.

A7.2 Evaluation of Results

A7.2. Achievement of the objectives of project/program development

Regarding the project's general objectives, the evaluation of activities indicates a general compliance of 100% of the indicators established in the results matrix. In several cases, compliance was greater than the established goal.

PDO 1– Area in which sustainable land-management practices were adopted because of the project

Sustainable land-use management practices as a result of the project were defined as the hectares of coverage related to the execution of subprojects in general; coverage related to the indigenous communities where community subprojects were executed; micro-basin areas that possess a planning process; hectares of reforestation of parallel projects that ITAIPU Binacional has developed or has under development (Carapá, Ypeti, and ITAIPU Preserva); hectares of private reserves presented to SEAM; and lands of the Kirito indigenous community in the District of Mbaracayú (Land Use Planning of the Mbaracayú District). From the baseline of 64,212 ha, 125,015ha are currently accounted for toward a proposed goal of 120,000 ha.

PDO2 – Number of hectares conserved in the Mbaracayú–San Rafael Conservation Corridor

The hectares conserved in the **Mbaracayú–San Rafael Conservation Corridor** have been defined as public and private protected areas that comprise the baseline, plus the private reserve areas that were presented to SEAM for their official recognition and the certified areas by private owners under Law 3001/06 of Environmental Services. Areas of managed resource reserves that currently have a Management Plan and previously did not are also included, as well as those that are under special management, such as the indigenous lands and reserve areas with certified forests in the San Rafael/Tekoha Guasu area. The baseline was 165,734 ha, and currently 233,353 ha are accounted for toward a proposed goal of 231,159 ha.

PDO 3– Number of hectares restored in the Mbaracayú–San Rafael Corridor

Forest restored hectares in the Mbaracayú–San Rafael Corridor include the native forests that are still ecologically viable to ensure biodiversity conservation, sustainable management or restoration. Type 1 subprojects are under this concept[19] (native forest sustainable management); type 2 subprojects (native forest restoration/regeneration). Restoration projects carried out by ITAIPU are also considered (Carapá Ypeti and ITAIPU Preserve), as well as privately owned forests with Environmental Certification by Law 3001/06. Zero (0) ha was established as the baseline, and currently 36,254 ha have been reached with an established goal of 30,000ha.

PDO 4– Number of producers that improve their forest management and integrate biodiversity conservation into their productive activities

For this indicator, number of producers is understood mainly as each one of the subprojects' beneficiaries, since each execution agreement signed stipulated the compliance of active safeguards, and of training processes, assistance and technical support to the producer. The beneficiary is also understood as the "family nucleus", especially of the farmer beneficiaries and the indigenous communities. That is why the subproject holder and his/her spouse are considered the trained family nucleus in the case of non-indigenous producers. The same were also beneficiaries of a series of trainings that reached other non-beneficiary producers as well. Among the trainings noted below are agroforestry, integrated pest management, control of leaf-cutting ants, forest nurseries, forest restoration, and, in the case of the IP, training in legislation and indigenous rights is added. 0 (zero) producers was established as a baseline, and currently 3.906 producers were reached, with an established goal of 1,500 producers, indigenous and non-indigenous.

PDO 5– Areas under biodiversity improved protection (ha)

The new private reserves proposed to SEAM and the new ITAIPU areas not included in the baseline are included as areas under improved protection. In addition, the areas of certified forests under Law 3001/06 of Environmental Services and beneficiary producers properties, including farmers and indigenous communities.

Two particular cases are also included, and they correspond to Ybytyruzu Managed Resources Reserve situations and some San Rafael /Tekoha Guasu properties, which have achieved agreements, commitments, and certifications for their conservation. During midterm revision and the Restructuring Paper, this topic was reconsidered and both areas were removed from the baseline due to the lack of implementation in the field. The baseline corresponded to the 165,734 ha of protected areas established before the project. Currently, 311,735 ha were achieved, and the established goal was 310,799 ha.

PDO 6– Number of hectares in 10 private protected areas

The number of hectares in 10 private protected areas was successively revised in all previous missions and during the Midterm Revision. The assumed conclusion and incorporated in the restructuring was to include the four private protected areas, included in the baseline, which were the Natural Reserves: from the Mbaracayú Forest, Morombi, Ypeti, and Tapyta.

[19] The investment funds for producers—the "Community Grants"—were named "subprojects" and consisted of the following three types. Subprojects I: management and sustainable use of native forest; subprojects II: restoration of Native Forests, both financed by the "Community Grants I" according to the agreement; and subprojects III: socio-productive investments financed by the "Community Grants II."

To fulfill the objective, the "Private Reserves" were considered as the forest reserve areas under private dominion, which have been presented to SEAM for their formalization, as well as those that were able to obtain their certification for payment for environmental services. As baseline for the four private reserves, 107,734 ha were accounted for. Currently, 131,353 ha have been achieved, and the established goal was 124,734 ha.

PDO 7– Greater capacity at the SEAM, MAG, and INDI to develop policies in priority areas
The definition of "greater capacity" was based on three action approaches: provision of infrastructure and vehicles; development of training sessions, and the development and adoption of new public policies related to BAAPA conservation. Strengthening MAG through the PRODERS Project was done by means of training sessions. The baseline assumed that the institutions were **NOT** strengthened and, currently, the actions developed under this framework **ARE** strengthened.

A7.2.b Achievements in the component objectives

Organization and training of beneficiaries in projects' design and follow-up
The UEP developed a working team for the first component composed of the coordinator for Component 1, a coordinator for subprojects, three zone promoters/monitors for the sub-corridors, and support personnel from the intern staff of ITAIPU. Adding to this team, an agreement was signed with the Inter-American Institute for Agricultural Cooperation (IICA) on May10, 2015, for following, supervision, and oversight of the execution of subprojects in the field, with which a contribution of 15 professionals and four 4x4 pick-up trucks was made. Twenty-three agreements with 15 regional implementing agencies and 754 beneficiaries were supported by the GEF funds, while seven agreements and 333 beneficiaries were funded by counterpart funds (ITAIPU and MAG). Regarding gender, 23% of beneficiaries were women and 77% were men.

Planned sub-basins. Planning work for sub basins agreed to were based on beneficiaries of the subprojects under execution. The micro basin planning workshops emphasized the development of local capacities to analyze the situation of the micro basin and later formation of a working table focused on three areas: environmental, social, and economic.
Participatory workshops for planning processes were undertaken for 11 micro basins at sites corresponding to subprojects. The sites were defined as a function of priority micro basins for the project and the presence of beneficiaries of the subprojects. These micro basins, when added to the 11 from PRODERS totaled 22 planned micro basins.

Component 2: Consolidation and Expansion of the National System of Protected Areas

Strengthening public protected wild areas: Development of three management plans. The SEAM officially approved management plan for PN Ñacunday was developed. This plan was built based on local participation taking into account the safeguards, especially indigenous safeguards, guaranteeing the full participation of two communities related to the area: Puerto Barra (Ache) and Ñacunday (Mbya). Work on the Management Plan for the Managed Resources Reserve of Ybytyruzú consisted of carrying out seven participatory workshops in municipalities and localities within the Reserve, including resident indigenous communities. Broad participation was accomplished and the Management Plan was completed and is now officially approved by SEAM.

Regarding San Rafael/Tekoha Guasu Protected Area, an important advance was achieved with the indigenous communities, principally through the "Association of Indigenous Communities of Itapua – ACIDI" indigenous organization. With them, a dialogue table was set up that held its first meeting on the 25th of November of 2015, and the second on the 29th of March of 2016, at Alto Vera District,

Itapúa. The signing of the "Caronay Agreement" was achieved that consisted in the recognition of the common interests of the participating stakeholders in forest conservation, and of the people, with special attention to the territorial claims of the Indigenous persons. The minutes and declarations of the Dialogue was signed by all stakeholders that participated.

In addition, the forests that possessed certificates of environmental services were incorporated through the Guyra Paraguay organization, totaling 7,200 ha. The commitment of 13,000 ha of indigenous lands that require strengthening, under schemes of forest certification for environmental services and the process of community mapping, was also obtained.

Implementation of four management plans: For the "implementation of management plans", it was established that this action corresponds to the compliance of activities within the management plans of protected areas. In this sense, the public or private protected areas that comply with two or more of the activities within the management execution of the area, qualify for this indicator. This indicator was partially achieved.

– *Biodiversity monitoring* (Component 4), work was also undertaken in the core areas.
We now have the design and planning of specific tourist use programs for the RN Yguazú, Maharishi, San Rafael, and Ybytyruzú reserves. This includes interpretive trails and the development of program content and their inclusion in regional programs on tourism use.

– In all, **six areas** have two or more implementation activities regarding the management plan. These are PN Ñacunday, PN Caazapá, RN Yguazú, RN Maharishi, San Rafael/Tekoha Guasu, and RRM Ybytyruzú reserves.

– Remodeling and construction of the ranger and administration building at the PN Ñacunday and planned construction for the remodeling of Puesto Enramadita at the PN Caazapá were undertaken. In both cases, this was done with the environmental license given by SEAM for management of the UEP. The executive project for the construction of a portico and guard house on the 500 ha donated to SEAM in the area of San Rafael/Tekoha Guasu was completed. To these works must be added the new office built at SEAM (in Asunción) (Component 3).

– **Title and notarization for PN Ñacunday—which lacked title—were obtained**. In addition, the 500 ha that were donated to SEAM in the area of the San Rafael/Tekoha Guasu reserve were titled. These 500 ha possess a particular achievement; they can now be considered as an effective part of the "San Rafael National Park". For the first time SEAM has a tract of public land in the area.

Institutional Capacity-Strengthening for SEAM, INDI, and MAG

INDI. The project financed the remodeling and construction of the Environmental and Social Unit and financed the provision of Human Resources for the effective implementation of the Socio-environmental Unit: two attorneys, one anthropologist, one forestry engineer, one information technologist, and one GIS specialist, among others. The project also supported equipment, transportation, and field work for an investment of about US$ 164,000.

SEAM. With regard to the process of strengthening SEAM, more than 100 staff were trained during the project development, a new two-story building was constructed for the Department Biodiversity Conservation and Protection (DGPCB), in charge of protected areas; four 4 x 4 pick-up trucks, contracting of two professionals to support personnel for the Division of Planning and the Communications area, the legal processing and deed for the 500 ha donated by Guyra Paraguay, among

others. Furthermore, the project supported SEAM with the development of seven policy studies for biodiversity conservation, specifically, the development of Generic Environmental Management Plans, thus complying with what was established by Law N° 294/03 "On the Evaluation of Environmental Impacts"; the proposal for the implementation of the Environmental Fund with emphasis on environmental services, thus complying with Law N° 3.001/06 "On Environmental Services"; study on the valuation of the environmental damage produced by deforestation, providing criteria for the implementation of measures within the framework of Law N° 422/73 "On Forests", of Law N° 294/03 and of N° 1561/01; Characterization of water balance of the upper basin of the Tebicuary River, as part of Law N° 3239 "On water resources", among others.

International knowledge-sharing. Similarly, the accomplishment of the "International Forum on Protected Areas and Biodiversity Corridors," the results of which were summarized and presented as a contribution for the modification of Law 352 on the SINASIP (National Protected Areas System). The forum was attended by 50 renowned international specialists as well as national representatives and more than 600 participants, including staff of SEAM; the organization of a workshop "Control System for Environmental Damages Workshop," in a participatory manner with the Public Prosecutor´s Office and the judicial authorities, with the presence of judges, prosecutors, and assistant environmental prosecutors, among others.

With regard to the strengthening of MAG, we focused on training processes and technical backing for the PRODERS project, through the participation of technicians and extension personnel in the training courses on Agroforestry Management and Ecosystem Restoration; the undertaking of 20 local workshops for producers on Integrated Pest Management with emphasis on cutting ants, among others.

Regarding support to the Ministry of Education and the national program of primary education, the project achieved the inclusion of the concept of Biodiversity in the school curriculum of six departments. Additionally, 108 training workshops on different themes were conducted with 5,445 participants.

Regarding project communications, the project developed a web site and had presence on social media. Road signs for the diffusion of the project were installed strategically on the most heavily transited roads in the six departments where the corridor is located. Another 1,200 signs were made for the project´s beneficiaries so that they could be easily identified. Material for diffusion, merchandising, and informational and pedagogic guides were developed.

A7.3 Implementation of the Indigenous Strategy

Fifty-five indigenous communities composed of 2,303 families, representing 10,756 persons, benefited from the project. The communities are distributed as follows: five of the Ache People, 23 of the Avá Guarani People, 26 of the Mbya Guarani People, and one community of the Pai Tavytera People. These occupy a territory of 65,195 ha, which is an important indicator of hectares under conservation. These communities implemented **291** community subprojects. The commitment of the members of the communities, the participation of men and women, as well as youth of both genders is highlighted. Women participated in equal conditions as men on the project.

Eighteen training meetings were undertaken, on Environmental and Indigenous Legislation and its effects on the conservation of natural resources, with IP and Agroforestry, on ecological restoration, and the conservation of micro basins. Total number of IP trained: 600. The objective was to strengthen the capacities of the IP, starting from the baseline of the previous knowledge they possess, developed using a workshop modality, both theoretical-practical and including exchange of experiences. Two

publications were prepared: *Guaraní Peoples in the Paraguay Biodiversidad Corridor* and *Lessons Learned around the Paraguay Biodiversidad Project – Indigenous Strategy*.

A7.3.1 General issues, other results, and impacts (if present)

(a) Impacts on poverty and gender aspects (social development) Poverty: The subprojects were executed in departments with extreme poverty (Caazapá and Caaguazú), equivalent to 66% of total investments made. The remaining 34% were executed in the departments of Canindeyú, Alto Paraná, Itapúa, and Guairá. **Gender:** 524 indigenous women participated directly in project activities. The development of microenterprises such as the manufacture of soaps and detergents, crafts, production of creams and lotions based on medicinal plants, among others, allowed for the participation of 327 women belonging to 13 different communities directly. Similarly, 115 women were trained on issues related to Agroforestry and 82 were trained on the Legal and Indigenous Environmental Framework.

b) Institutional Change / Strengthening:
The incorporation of the concept of "biological connectivity" as an institutional policy of ITAIPU Binacional, through the ITAIPU PRESERVA project, which seeks to restore more than 2,060 within the protection strip of the Reservoir and the management of 490 ha of regeneration areas, becoming the largest corridor in the region, with more than 524 km of a continuous strip, connecting the 8 natural reserves belonging to the Binacional, as a fundamental component of the biodiversity corridor. The creation of the Socio-environmental Unit of INDI positively influenced the development of actions in the territory, supporting community organization, the official recognition of leaders, the titling of lands, and intervening in indigenous-farmer conflicts, principally related to land tenure.

(c) Other results and unintended impacts
Strengthening of indigenous executing organizations was promoted, fundamentally on the methodology of Project approach, consulting processes, and close following of the EI and the executor. In addition, a process of adaptation to the cultural milieu of each people (cultural focus).

Boosting the commercialization of income-generating agricultural products (honey), as well as crafts production and alternative income products (detergents) at indigenous communities. Strengthening of project administration issues and accountability, generating background of good management, and compliance with technical and administrative policies, safeguards, with non-indigenous implementing parties. Participation of cooperatives of medium-sized producers (Yguazu and COPRONAR), through the establishment of forest committees, fundamental to the objectives of forest restoration.
– Incentive to organic production through which producers from the trained basins to become a part of the Organic Producers of Paraguay Group (Carupera locality, Yvypyta district, and Canindeyú department).

– Participation of various stakeholders, the academic scientific community, producers, indigenous persons in the International Forum on Protected Areas, the first of its kind undertaken in the country.

Management Evaluation of the Project
The World Bank task manager worked with the implementer and regional co-implementing agencies to implement institutional arrangements, which, during 2010–2012 reached only an incipient stage of development because SEAM authorities strongly opposed the project's proposed architecture of the project and questioned the implementing role of ITAIPU. Beginning in 2013, the structural organization of the project was implemented effectively, with important restructuring, taking into account the useful period for the execution of the project and the maximum term with a date extension for the final disbursement. The Bank also incorporated the position of project co-TTL, who closely

followed all activities and was a key position to support project management and for the needed guidance of project activities. Similarly, the No Objections was obtained from the Management for the processes in form and on time. Accordingly, management was considered satisfactory.

Evaluation of the Management of the Financial Area of the Bank

The implementation of a Concurrent Audit as a previous condition for category 2 disbursements caused considerable delays, since the short list required by the Bank could not be achieved. Without disregarding control mechanisms that must be put in place, the market and the possibility of obtaining the minimum number of firms required by the Bank for this type of contract must be considered. This was corrected by modifying the source of contracting, using ITAIPU´s norms and financing it with counterpart funding. This delay caused that the subprojects with donation funds could only be executed during the last period of the project implementation.

Evaluation of Procurement Management

The procurement processes were in reality one of the points that threatened the implementation of this project. The Procurement Norms that applied to the project were published by the World Bank in 2004 and revised in October of 2006. The rigid nature of the Procurement Norms with regard to the Short List for contracting of firms: a minimum of 6 (six) firms, caused several "Void Declarations" of contract bidding. The small pool of firms in the country and in other cases, firms that present Conflicts of Interest in contracting processes became a barrier to the period of execution. In lessons learned the fact that the Bank should be more flexible with regard to the number of firms needed for the Short List in cases where the market is extremely limited at the national level and the execution times make opening the process to international firms difficult, should be incorporated.

Evaluation of Disbursement Management

Regarding disbursements, the Bank´s performance was excellent. At the beginning of the project, the disbursement letter only provided for two modalities: advancements to the designated account and direct payments. The amount of the advance had a maximum value of USD 450,000. Similarly, the original disbursement letter did not foresee the modality through which category 2 disbursements would be disbursed: subprojects. In order to correct this, a modification was processed, which was approved. In general, the project received permanent support from the Bank´s disbursement staff in Brasilia. We consider that its performance was highly satisfactory.

Evaluation of the Social Area (Indigenous Strategy)

The sectoral specialist provided support for the design of the indigenous strategy to be implemented and promoted linkages with those responsible for the PRODERS project, and through those experiences, lessons learned were derived.

P/A

Lic. Mirna Chamorro
Directora General Alterna
Proyecto Paraguay Biodiversidad /ITAIPU Binacional

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Not applicable

Annex 9. List of Supporting Documents

ITAIPU Binacional –COMYCSA. 2016. Análisis económico y financiero e informe de encuestas y talleres con beneficiarios y implementadoras.

ITAIPU Binacional. Paraguay Biodiversidad. 2007. Evaluación Ambiental.

ITAIPU Binacional. Paraguay Biodiversidad. 2007. Evaluación Social.

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ITAIPUBinacional. Paraguay Biodiversidad. 2016. Datos Generales y Específicos de los Sub-proyectos Comunitarios Indígenas.

Secretaría Técnica de Planificación. 2014. Plan Nacional de Desarrollo Paraguay 2030.

World Bank. 2010. *Project Appraisal Document. Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Easter Paraguay Project.*Report No. 54487-PY. Washington, DC: World Bank.

World Bank. 2014. *Estrategia de Alianza con la República del Paraguay para los Años Fiscales 2015–18.* Washington, DC: World Bank.

World Bank. 2014. *Restructuring Paper on a Proposed Project Restructuring of Conservation of Biodiversity and Sustainable Land Management in the Atlantic Forest of Easter Paraguay Project.* Report No. RES14486.Washington, DC: World Bank.

World Bank. 2016. Little Green Data Book 2016.

Annex 10. Causal Chains of Project Outcomes

To assist the Member Country's continued efforts to achieve sustainable natural resource-based economic development in the Project Area

Paraguay is a landlocked country with an economy that is dependent on natural resources (soil, water, land). About 50% of the GDP is derived from agriculture (especially commodities such as soybeans) and hydropower, primarily within the Oriental (eastern) region which harbors extraordinary water resources and rich soils.
The Mbaracayu-San Rafael Corridor promoted by this GEF project represents an area of 1.14 million hectares on this Oriental Region, where precisely soy plantations dominated the landscape and rivers draining this area flows to the Parana River that feeds the ITAIPU and Yaceryta hydropower plants and also to the Paraguay River the main waterway for the transport the agriculture exports of the country.

The Atlantic Forest has been reduced as the commodity boom grew in the Oriental region. Once a biodiversity hotspot, only less than 6% of this forest is left and thus the government has launched several laws, regulations and initiatives[20] to try to reduce deforestation and preserved what is left. Can this economic development of Paraguay be sustainable in the Oriental region and the Corridor and to some degree coexist with forest lands and biodiversity? This project with a small financial contribution (US $4.5million) was able to leverage another US$14.1 million to test in the project area if this could be possible. The results of this project indicates that this is possible, since it creates many benefits especially for forest dependent communities and small farmers, but the Corridor area will require constant support to maintain the engagement of communities and farmers, public-private partnership, government and ITAIPU interest to restore the UPAF and achieve this balance between economic development and conservation. Other countries in Latin America, such as Costa Rica once faced similar deforestation issues due to agriculture development as in Paraguay, but the volatility of the agriculture sector and decisive policy making of several governments changed this path, and after 35 years, the country is a conservation reference to the world and currently has 53% of forest cover.

Despite of many factors against the objectives of this project such as: i) high prices for land (renting or selling), ii) land tenure issues (lack of land title, 77% of the land owned by 1% of the population), iii) limited public forest land and protected areas, iv) high commodities prices that provided significant economic incentives for deforestation, v) extensive rural colonization programs in forest land, vi) invasions of forest lands, vii) limited application of environmental legislation, viii) limited interest of large landowners in restoration, among other issues, the project was able to achieved all 7 GEO indicators and 27 of all intermediate indicators and the project generated and will generate many economic benefits.

The support of the project to the GoP to achieve sustainable natural resource-based economic development in the Project Area was agreed by the Bank and the GoP - to be achieved by the implementation of five pillars: (a) establishing the Mbaracayú–San Rafael Conservation Corridor

[20] Zero Deforestation Law, environmental impact evaluation (Nº 716/96), reforestation law (Nº 536/95), wildlife conservation law (352/94), water law to protect rivers and subterranean waters (3239/2007), environmental services law (3001/06) and a National Biodiversity Strategy.

within public and private lands through sustainable native forest management practices for biological connectivity; (b) encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation; (c) strengthening MAG's institutional capacity to implement conservation techniques in the rural landscape; (d) strengthening SEAM's institutional capacity to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of such activities; and (e) strengthening the National Protected Areas System.

The main partners for the building of this corridor were small famers owning less than 20 ha, (mostly own only 10 ha) and indigenous peoples. The project also had very good results with medium size farmers (which own more than 50 ha) grouped in Associations and cooperatives. The Subprojects that intervened in these properties did not only apply better agricultural practices for the environment, it planted important species for benefit of fauna and erosion control, and also provided food contributing to family food security, crops for selling, and diversification of income sources.

About US $ 11 million were expended in the local economies of 55 districts which provide jobs for NGOs, famers and indigenous associations or groups (implementing regional agencies), local nurseries, purchase of pest control equipment, bee hives, environmental education materials, etc.

Also the cost benefit analysis (Annex 5) shows that the project is generating large economic returns even under conservative assumptions and throughout different scenarios. This analysis contrasts the actual costs with economic benefits for the first 15 years, both discounted to 2013 (the baseline year). The benefits originate from establishing conservation corridor through sustainable native forest management practices on 103 873 ha, encouraging sustainable agricultural practices on 125 015 ha, and strengthening the National Protected Areas System on 169 620 ha. The benefits from the project are more than six times larger than the costs throughout almost all scenarios and create a net present value of over one billion USD. Benefits are assumed to be generated from carbon sequestration, watershed protection, bioprospecting, sustainable timber harvest and existence value benefits from the respective areas. Costs are a combination of the actual financial costs of the projects from all counterparts, i.e. US $18.6 million, and the opportunity cost of land. The high NPV can be explained by the fact that opportunity costs of land and the benefits from conservation are accounted for in every year and therefore any difference between benefits and costs is magnified over time. Moreover, the area that has been conserved, restored, protected and put under sustainable management is very large – about the size of the Republic of Malta.

Some of the sustainable land use practices supported by the project that will generate economic income to project beneficiaries are:

1. Agroforestry: planting of tree species mixed with agricultural farms (beans, banana, mandioca, etc). Tree species included: native species, yerba mate, fruits (oranges, avocado, banana), and fast growing species for firewood (eucalyptus).
2. Honey production: the project supported the setup of 1,200 honey boxes in 255 farms. Each box produces 15 liters of honey/year. In this way, the project is helping to produce 18,000 liters per year, which has a value of production of US $77,319 per year.
3. Yerba mate production: the project supported the setup of 856 hectares of yerba mate. The value of this production is US $397,113 and US$661,855, in the fourth and fifth year of production, respectively.
4. Organic certification: the project supported the certification of heart of palm with forest cover (shade grown).

Eucalyptus:

The project financed the purchase and planting of 524,552 seedlings of eucalyptus to serve as a source of firewood instead of native trees species from the Corridor and a cash crop. The total number of farmers benefited from these eucalyptus trees are: 826.

1 hectare with a density of 1112 seedlings, can produced 420 tons at the end of the plantation cycle (10 years).[21] It is estimated that about 70% of product can be used for selling of the wood and 30% for home firewood. Eucalyptus trees can be harvested at 2, 5 and 10 years.

According to official data from INFONA, a hectare of eucalyptus with a density of 1112 seedlings in the second year will generate an estimated income of 3,000,000 Guaranies (US$ 536), for the fifth year will be 10,675,000 Guaranies (US$ 1,837), and in the 10th year will be 60.160.000 Guaranies (US$ 10,354), giving a total of 73,835,000 Guaranies (US$ 12,708). This is an important income that the project beneficiaries will be entitled to receive during the production cycle for harvesting firewood or for the sale of wood.

The project supported about 471 hectares of eucalyptus which represent a future income of US $5,985,468 for the 826 beneficiaries of the project at the end of 10 years.

Savings from firewood

According to national estimates from the Government[22], rural families of Paraguay consumed about one 'carreta' (cartload) of fuelwood (about 1.5-2 m^3) per week and each carreta cost about 50,000 Guaranies, thus project beneficiaries of eucalyptus planting will save 200,000 Guaranies or (US $35) per month or 420 dollars per year.

Yerba Mate

Yerba mate is an endemic species from Paraguay which has commercial and cultural value. Yerba mate is consumed locally and internationally (Argentina, Uruguay, other countries). The project financed the purchase and planting of 1,285,000 seedling of yerba mate for family consumption and for having an additional cash crop. According to national estimates from MAG, a rural family of six members consumed between 100 y 120 kg de yerba mate/per year or about 2 kilos per person/year. The total number of farmers benefited from the yerba mate seedlings were: 413.

Yerba mate trees start production after 4 years and the plants can live about 25 years. According to the national estimates of the Ministry of Agriculture of Paraguay[23]: 1 hectare of yerba mate can have a productivity of 1,500 kg/ha for the first cut (at the third year after planting), and 2,500 kg/ha for the second cut (at the fourth year). The price of yerba mate at the farm is about 1800 Guaranies (US$0.30) per kg.

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[21] INFONA. 2014. Rentabilidad de la Inversión en Plantación de Eucaliptus con Fines Maderables. http://www.infona.gov.py/application/files/8514/3204/8894/Rentabilidad_de_la_inversion_forestal_220414.pdf

[22] MOPC, VMME, GTZ. 2013. Mejoramiento de la base de datos para una política energética sustentable.

[23] MAG- GTZ.2007. Manual de Agroforestería. ISBN: 978-99953-65-00-4.

The project supported the planting of 856 hectares of yerba mate which can generate a production of 1,284,000 kg in the first harvest and 2,140,000kg at the second harvest, which will represent an income of 2,311,200,000 Guaranies (US$ 397,113) and 3,852,000,000 Guaranies (US$661,855), respectively, and for a total of US$ 1,058,969. Thus, after the fifth year harvest, each beneficiary farmer could have an approximated annual income of US $1,605 for the yerba mate planting.

The Fundacion Moises Bertoni an important NGO which serves as a regional implementing agency for the project and lead subproject implementation with farmers and IP's around the Mbaracayu Protected area has estimated that the farmers benefited from the project by planting yerba mate with shade (forest cover) will receive about 1,925 Guaranies per kilo as part of an pilot initiated with the international Guayaki OrganicYerba Mate company that is seeking mate planted with forest cover and organic methods.

Native species.
Yerba mate was planted mixt with native trees native species from Eastern Paraguay and species include: Cancharana (*Guarea canjerana*), Cedro (*Cedrela fissilis*), Peterevy morotî (*Cordia glabrata*), Guatambu (*Balfourodendron riedelianum*), among others.

1 ha of yerba mate planted with native forest cover of about 187 trees per hectare can produce 120 m3 of wood after 12-15 years or 1320 m3 of Alto Parana wood (local unit) which a market price for precious wood from the Eastern region is about 50,000 Guaranies[24] (US$8.61) per m3 (Alto Parana m3), generating about 66,000,000 Guaranies (US$ 11,359) per hectare. Prices will vary for species and age.

Honey production

Apiculture (honey production) is an important activity for farmers in the Corridor because it generates an extra crop to the family economy, but it is also important for increasing pollination of the farm crops and of forest remnants.

The project benefited 255 number of farmers with 1200 bee hive boxes. According to the Ministry of Agriculture of Paraguay, each box can produce 15 liters of honey per year (conservative estimate) and a liter of honey at the farm is paid approximately 25,000 Guaranies. 1200 boxes delivered by the project will generate about 18,000 liters of honey which will represent an approximate annual income of 450,000,000 Guaranies (US $ 77,319) for the 255 beneficiaries or US$ 303 per each beneficiary per harvest, if 3 harvest are collected in the year, the income for each farmer will increase to US $909 per year.

These income estimates can be higher since we are not considering other income from the sales of pollen, bees wax and royal jelly. The apiculture subprojects represent an important income to the family since the average salary for a farm worker (2016 data Ministry of Labor) is 75,558 Guaranies per day (USS13) or (US$ 260 month).

[24] MAG-GTZ-KWf. 2011. Manejo Forestal y Agricultura de Conservación. Experiencias de pequeños productores en la Región Oriental de Paraguay. Proyecto Manejo Sostenible de Recursos Naturales

Causal Chain 1	Performance Indicators
Outcomes	Establishing the Mbaracayú–San Rafael Conservation Corridor within public and private lands through sustainable native forest management practices for biological connectivity
Intermediate outcomes	– Farmers and Indigenous Peoples from 55 districts implementing actions that supports sustainable use of biodiversity and natural resources such as: establishing honey hives (apiculture) to improve pollination and generate food and income; reduce use of forest wood by using efficient cook stoves delivered by the project; planting of yerba mate which is an endemic species within forest land that generate food and income (315 subprojects). – Individual farmers and farmers' cooperative and indigenous communities participating in the restoration of the corridor by planting native species to reduce slope erosion, protect water courses, and provide habitat for local fauna (797 subprojects). – Private sector (farmers, cooperatives, and local businesses); local communities (Indigenous Peoples); public sector (municipalities, MAG, and SEAM), and ITAIPU participating in improving watershed management and protection in 20 corridor watersheds. – ITAIPU reserves, public protected areas, and private forestland engaged in connecting forest areas and building the first corridor in the country.
Outputs	– 125,015 ha within the productive landscape are under sustained effective management for conservation and production; – 233,353 ha conserved,67, 619 additional hectares from the baseline; – 1,000 ha restored in the Carapá Sub-corridor; – 3,906 producers have improved forest management and integrated biodiversity conservation into their productive activities; – Official declaration by the government that the corridor is of national importance; – 50 large road signs and 1,200 other signs placed along the corridor and in the communities to promote awareness and ownership.
Inputs	– Investments of US$2.4 million from the grant (53% of the total) in local goods and services; – Investments of US$9.4 million from local counterparts (ITAIPU, MAG, and beneficiaries); – Implementation of 63 agreements with regional/local entities; – Hiring of 20 field staff to coordinate with regional implementing agencies; – Fifteen ITAIPU staff assigned to the project; – Purchase of eight 4x4 vehicles for M&E; – Hiring of IICA for M&E with ITAIPU co-financing (US$437,000)

Causal Chain 2	Performance Indicators
Outcomes	Encouraging sustainable agricultural practices that maintain biodiversity within productive landscapes, while increasing productivity and mainstreaming biodiversity conservation

Intermediate outcomes	– Individual farmers and indigenous communities knowledgeable on socio-productive initiatives that can support their local likelihoods, farm production—initiatives that are also beneficial for environment (339 subprojects). Initiatives includes: Increase productivity of farms (PRODERS by giving seeds, small farm animals, and equipment); use of green fertilizers (legumes that fix nitrogen and increase soil organic matter); crop rotation (to reduce use of chemical fertilizers and pest control), cover crops (to reduce soil erosion and use of fertilizers), direct planting (reduction of tillage and soil erosion); reforestation with native species and fast-growing plants (eucalyptus) for fuelwood; planting of fruit trees (important for crops and birds), restoration of riparian areas (important to protect water sources for farm and family needs), and use of lime 'cal' (to reduce use of agrochemicals on the farm). – Reduce use of agrochemicals in the farm by promoting the use of Integrated Pest Management and delivering culturally adapted tool kits (including the use of traditional plants and alcohol to treat local pest (ants and termites).
Outputs	– 125,015 ha within the productive landscape are under improved management for conservation and production; – 3,906 producers benefited their farm and the environment (1,232 PRODERS; 1,858 from PYBio; 816 from IP communities); – 60 training courses to farmers and IP communities on best practices for sustainable agriculture practices, agroforestry, silviculture, apiculture, integrated pest management, biodiversity, corridor, and micro-watershed protection); – 7 farmers-cooperatives agreements with cooperatives leading the sustainable land-use project in their communities.
Inputs	– Delivery by PRODERS of farm equipment and animals (chickens, seeds, and beehives) to increase productivity: about US$ 3.6 million; – US$ 666,000 from the grant for sub-productive subprojects; – Hiring of IICA agriculture experts (US$450,000); – Technical assistance to producers (US$400,000); – Delivery of integrated pest management tool kits: US$ 50, 000; – Delivery of about 1 million seedlings (native species, endemic, and endangered tree species: US$500,000; – Use of eight 4x4 vehicles for operational and M&E activities.

Causal Chain 3	**Performance Indicators**
Outcomes	Strengthening the institutional capacity of **MAG** to implement conservation techniques in the rural landscape

Intermediate outcomes	– Staff members from MAG and PRODERS have improved capacity and knowledge on key priority environmental areas such as biodiversity conservation, restoration of landscapes, forest conservation, and the corridor model as a landscape management strategy. – MAG/PRODERS staff, by participating in the missions and M&E activities, facilitated Project Council's learning regarding the challenges and opportunities of a biodiversity and NRM project in the Oriental rural landscape of Paraguay for increasing forest connectivity. – Extension services of DEAG and rural development projects (PRODERS) incorporated biodiversity conservation and NRM aspects within the productive system in the corridor project area.
Outputs	– 30 MAG/PRODERS staff benefited from 35 training courses on best practices for sustainable agriculture practices, agroforestry, silviculture, apiculture, biodiversity protection, integrated pest management, conservation of watersheds, and environmental safeguards policies. – 15 staff of PRODERS had hands-on experience during the 10 micro-watershed diagnostic and planning processes in joint efforts with the PIU project team, and national and international experts (CATIE, IICA, and National University). – Participation of 10 MAG/PRODERS staff in the International Forum on Corridors of Biodiversity and Protected Areas held in Asunción that had 600 participants. – Participation of 20 MAG/PRODERS staff in technical training on integrated pest management. – Piloting of on-farm NRM investments in 117 subprojects within 10 micro-catchments in the proposed corridor that increased farm productivity, use of green fertilizers, reduced use of agrochemicals, direct planting, and reduced tillage. – MAG participated throughout the project implementation period as part of the Project Management Council, at the project decision-making level, together with ITAIPU, SEAM, and INDI.
Inputs	– Hiring of national and international experts as trainers, CATIE, and IICA to support technical assistance on sustainable agriculture, agroforestry, integrated pest management, and so forth (US $605,000 from GEF); – Printing of educational material; – Eight 4x4 vehicles to support capacity-building.

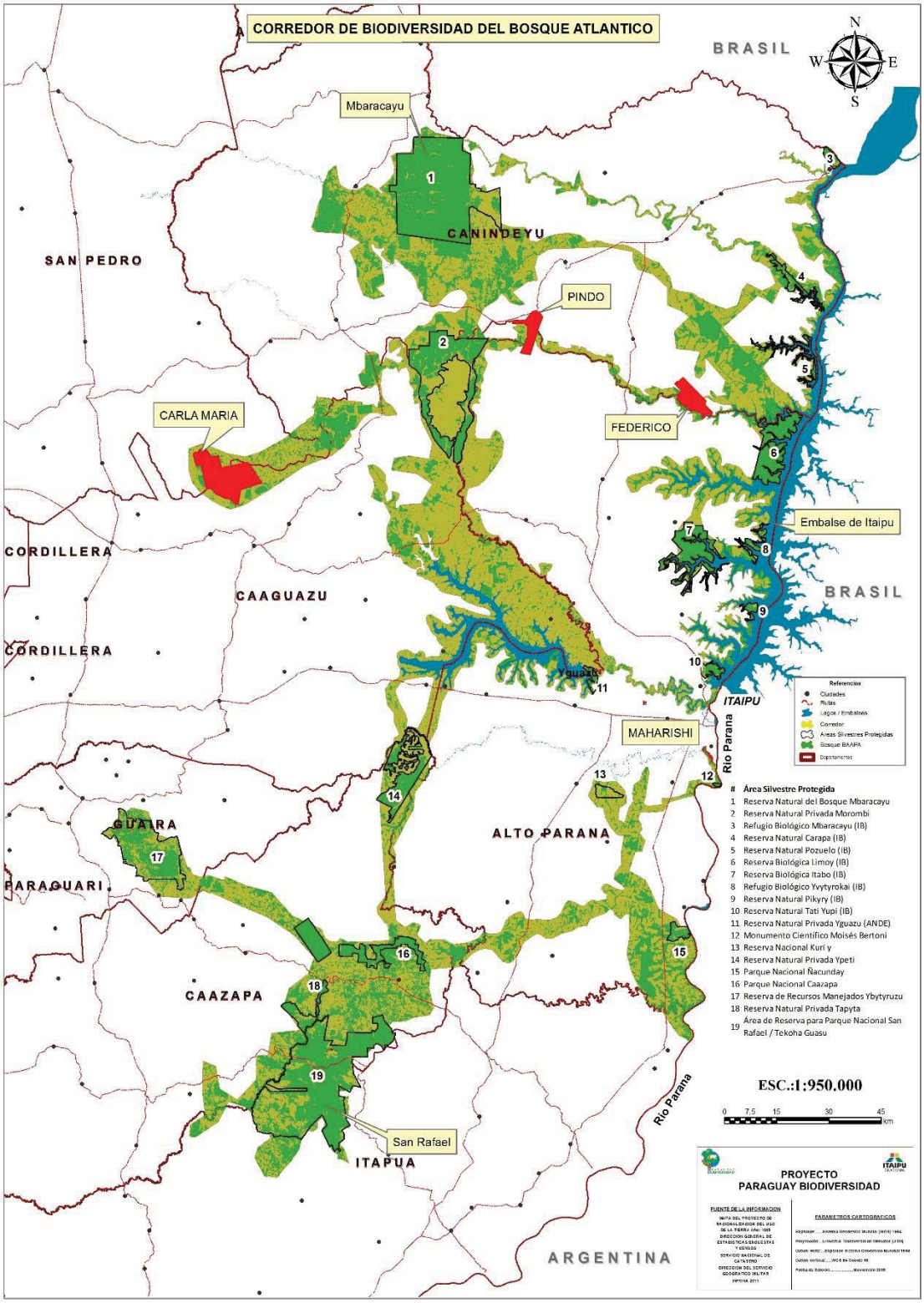
Causal Chain 4	**Performance Indicators**
Outcomes	Strengthening the institutional capacity of **SEAM** to improve knowledge on forest and biodiversity conservation activities, including the monitoring and enforcement of those activities

Intermediate outcomes	– SEAM has improved its capacity and knowledge regarding forest and biodiversity conservation and monitoring; – SEAM is informed of mechanisms to promote forest restoration and in the use of the corridor model as a landscape management strategy in the Atlantic Forest (this is the first corridor experience in the country); – SEAM are equipped with policy and regulation proposals to improve forest and biodiversity conservation and its management; – SEAM operational capacities are improved for conservation of and monitoring of Biodiversity and forest and in enforcement environmental legislation.
Outputs	– 100 staff from SEAM participated in 25 national and international training events, including trainings on best international practices for corridors management; conservation of water resources; forest certification methods; *Panthera Onca* seminar on endangered mammals; Instruments to determine the economic cost of environmental damage; International Forest Forum in Durban, South Africa; COP21–Paris, International Forum on Protected Areas and Corridors held in Asuncion, 2016, among others. – A biodiversity monitoring system using cloud base access was developed and it is hosted at the National Natural History Museum – Six proposals to improve policies and regulations connected to forest, environmental impact assessment, conservation of water resources and natural resources management (Proposal for an Environmental Fund– Law 3001/0, Development of Generic Environmental Management Plans – Law 294/93, Proposed Methodology for Assessment of Environmental Damage, Hydrological Study of the Headwaters of the Tebicuary River, among others). – SEAM is an active member of the Project Management Council, which led decision making of the project, defined the technical specifications for five policy and regulations proposal studies. – Construction of infrastructure for improving management of forest, biodiversity and protected areas: a two-story building (600 m^2) fully equipped to host the National Directorate of Biodiversity and Protected Areas of SEAM, which will benefit the overall protected areas management system of the country. – Publication of Compendium of Environmental Legislation, project and WWF–Climate Change.
Inputs	– Investment of approximately US$ 500,000 from the grant about in the institutional capacity plan; – Investment from ITAIPU of approximately US $ 700,000; – Purchase of two 4x4 vehicles, repair of five SEAM vehicles, repair radios, and so forth.

Causal Chain 5	**Performance Indicators**
Outcomes	Strengthening the **National Protected Areas System**

Intermediate outcomes	–Local communities, the private sector, and government engage in the planning and strengthening management of four national protected areas (Caazapá, Ñacunday, Ybytyruzu, and San Rafael). – Official conservation of two protected areas is achieved by obtaining the land title and adjusting their legal and administrative situation that was lacking for decades. –Private sector contributes to the conservation of the Atlantic Forest and the Protected Areas system by proposing 23,619 hectares as private reserves to SEAM.
Outputs	–Development of two management plans for Ñacunday and Ybytyruzu protected areas through a participatory process that included local leaders, the private sector, communities, IP, SEAM, INDI, local governments, NGOs, and experts on protected areas. – Two National Dialogues and two cooperation agreements among local communities; IP; government (INDI, SEAM, municipalities, INFONA, and Ministerio Publico); ITAIPU; and NGOs for improving conservation of the San Rafael protected area in accordance with the IP cultural vision of the area, achieved after decades of lack of communication and conflict. –Official registration of land titles of two protected areas (500 ha in San Rafael and 2,000 ha of Ñacunday) with an estimated land market value of US$12.5 million dollars. –Provision of technical assistance to design a demarcation plan of Ybyturuzu Managed Resource Reserve, and the Ñacunday National Park and nature trail system for ecotourism development. –Construction of infrastructure for improving management of protected areas: (i) Ñacunday and Caazapá (park offices, park signs, and park-ranger lodging); (ii) two-story building (800 m^2) fully equipped to host SEAM's National Directorate of Protected Areas, which will benefit the country's overall protected areas management system. – Periodic communication, planning, and project management.
Inputs	– Investing in advisory and technical services to prepare management plans, hold consultations, training, organizing workshops, construction of infrastructure, and strengthen SEAM's capacities to patrol, conserve, and manage protected areas in the corridor and nationwide. – Delivery of two4x4 vehicles to SEAM. – Hiring of three staff for SEAM to promote communication, project management, natural resources planning, project results, and so forth.

Map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Área Silvestre Protegida
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2 Reserva Natural Privada Morombi
3 Refugio Biológico Mbaracayu (IB)
4 Reserva Natural Carapa (IB)
5 Reserva Natural Pozuelo (IB)
6 Reserva Biológica Limoy (IB)
7 Reserva Biológica Itabo (IB)
8 Refugio Biológico Yvytyrokai (IB)
9 Reserva Natural Pikyry (IB)
10 Reserva Natural Tati Yupi (IB)
11 Reserva Natural Privada Yguazu (ANDE)
12 Monumento Científico Moisés Bertoni
13 Reserva Nacional Kuri y
14 Reserva Natural Privada Ypeti
15 Parque Nacional Ñacunday
16 Parque Nacional Caazapa
17 Reserva de Recursos Manejados Ybytyruzu
18 Reserva Natural Privada Tapyta
19 Área de Reserva para Parque Nacional San Rafael / Tekoha Guasu
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