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IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-95979)

ON A

GRANT FROM THE GLOBAL ENVIRONEMT FACILITY TRUST FUND

IN THE AMOUNT OF US$ 5.0 MILLION

TO THE STATE OF RIO GRANDE DO SUL

FOR THE

RIO GRANDE DO SUL BIODIVERSITY PROJECT

September 29, 2016

Environment and Natural Resources Global Practice
Latin American and Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 30, 2016)

Currency Unit =
R$ 1.00 = US$ 0.28
US$ 1.00 = R$ 3.60

BRAZIL – GOVERNMENTAL FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

APA	Área de Proteção Ambiental/ Environmental Protected Area
CBD	Convention on Biological Diversity
CoP	Conference of Parties
CPS	Country Partnership Strategy
CSI	Core Sector Indicators
EMATER/RS	Associação Rio-grandense de Empreendimentos de Assistência Técnica e Extensão Rural / Technical Assistance and Rural Development Enterprise
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária/ Brazilian Agricultural Research Corporation
FEPAGRO	Fundação Estadual de Pesquisa Agropecuária / State Foundation for Agriculture and Livestock Research
FEPAM	Fundação Estadual de Proteção Ambiental/ State Foundation of Environmental Protection
FM	Financial Management
FZB	Fundação Zoobotânica/ Zoobotanic Foundation
GEF	Global Environment Facility
GEO	Global Environment Objective
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion and Results Report
IPF	Investment Project Financing
IPPF	Indigenous Peoples Framework
IRR	Internal Rate of Return
ISR	Implementation Status & Results Report
M&E	Monitoring and Evaluation
MMA	Ministério do Meio Ambiente / Ministry of the Environment
MTR	Mid-Term Review
NGO	Non-Governmental Organization
PAs	Protected Areas
PAD	Project Appraisal Document

PDO	Project Development Objective
PIU	Project Implementing Unit
REA	Rapid Ecological Assessment
RS	Rio Grande do Sul
R$	Brazilian Real
SEFAZ	Secretaria Estadual da Fazenda / State Secretariat of Finances
SEPLAG	Secretaria Estadual do Planejamento e Gestão - State Secretariat of Planning and Management
SEMA	Secretaria Estadual do Ambiente e Desenvolvimento Sustentável / State Secretariat of Environment and Sustainable Development
TNC	The Nature Conservancy
TTL	Task Team Leader

Senior Global Practice Director (acting):	Julia Bucknall, GENDR
Practice Manager:	Raúl Alfaro-Pelico, GENDR
Project Team Leader:	Bernadete Lange, GENDR
ICR Team Leader:	Alberto C. G. Costa, GSURR

BRAZIL
Rio Grande do Sul Biodiversity Project

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A. Basic Information			
Country:	Brazil	Project Name:	BR GEF Rio Grande do Sul Biodiversity
Project ID:	P086341	L/C/TF Number(s):	TF-95979
ICR Date:	09/29/2016	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF RIO GRANDE DO SUL
Original Total Commitment:	USD 5.00M	Disbursed Amount:	USD 5.00M
Revised Amount:	USD 5.00M		
Environmental Category: B		**Global Focal Area:** B	
Implementing Agencies: Secretaria do Ambiente e Desenvolvimento Sustentável (SEMA); Fundação Estadual de Meio Ambiente (FEPAM); Associação Rio-grandense de Empreendimentos de Assistência Técnica e Extensão Rural (EMATER/RS); Fundação Zoo-Botânica (FZB); The Nature Conservancy (TNC).			
Cofinanciers and Other External Partners: not applicable			

B. Key Dates				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	08/06/2007	Effectiveness:	09/23/2010	02/23/2011
Appraisal:	05/14/2009	Restructuring(s):	12/03/2014	
Approval:	12/22/2009	Mid-term Review:	11/04/2013	12/27/2013
		Closing:	02/28/2015	03/31/2016

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):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes[1]	Quality of Supervision (QSA):	None
GEO rating before Closing/Inactive status	Satisfactory		

D. Sector and Theme Codes		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
General agriculture, fishing and forestry sector	73	73
Public administration- Agriculture, fishing and forestry	27	27
Theme Code (as % of total Bank financing)		
Biodiversity	67	67
Other environment and natural resources management	18	18
Rural services and infrastructure	15	15

E. Bank Staff		
Positions	**At ICR**	**At Approval**
Vice President:	Jorge Familiar	Pamela Cox
Country Director:	Martin Raiser	Makhtar Diop
Practice Manager/Manager:	Raúl Alfaro-Pelico	Karin Erika Kemper
Project Team Leader:	Maria Bernadete Ribas Lange	Maria Bernadete Ribas Lange
ICR Team Leader:	Maria Bernadete Ribas Lange	
ICR Primary Author:	Alberto C. G. Costa	

[1] The Project was flagged during FY12/FY13 because of the lack of disbursements for more than 12 months.

F. Results Framework Analysis

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

The objective of the project is to promote the conservation and restoration of biodiversity in the state's grassland ecosystem in the Rio Grande do Sul's territory by mainstreaming biodiversity conservation within the forestry, agriculture and livestock productive landscapes.

Revised Global Environment Objectives (as approved by original approving authority) and Key Indicators and reasons/justifications

Not applicable.

(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 :	500 rural properties with biodiversity conservation practices at farm level in the Pampa Biome.			
Value (quantitative or Qualitative)	0.00	500		577
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (115%). At the end of Project, 577 rural properties were successfully supported with biodiversity conservation practices by EMATER/RS. The sustainable practices supported included the following activities: (i) sustainable management of grasslands; (ii) agroforestry systems management (cropland-livestock- forestry); (iii) agroforestry systems management (livestock-forestry); (iv) native bees' management; (v) organic fruits production; (vi) organic grain and vegetable production; and (viii) medical plants. The area brought under sustainable management practices was 5,056.03 hectares. The current literature points out that these practices contributed to biodiversity conservation by: (i) reducing pressure of planted pastures with alien invasive grass species; (ii) controlling invasive species; (iii) restoring natural grassland landscapes; (iv) avoiding soil erosion; (v) reducing pressure to deforest additional land for agriculture; (vi) providing habitat and resources for partially forest-dependent native plant and animal species, which would not be able to survive in a purely agricultural landscape, and (vii) conferring suitability to landscapes as habitat for native fauna and flora. In short, these practices have positive effects on biodiversity that reach beyond the limits of an individual agroforestry system, extending to the entire landscape.			

Indicator 2 :	State conservation unit system improved with management plans and infrastructure of the at least 10 conservation units, totaling 72,000 hectares under protection.			
Value (quantitative or Qualitative)	0.00	10 protected areas, 72,204 ha		11 protected areas, 223,432 ha.
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed the number of protected areas (conservation units) supported (110%) and the area under protection. Eleven protected areas were supported through the existing Biodiversity Conservation Program (*medidas compensatórias*) consolidating the protected areas in the biome. Nine of the 10 initially selected protected areas were supported. Two additional protected areas were supported: (i) Delta do Jacuí Environmental Protection Area (*Área de Proteção Ambiental* – APA) and (ii) APA Banhado Grande. Activities supported included: infrastructure investments, management plans, acquisition of equipment and durable goods; fencing; environmental education; and enforcement. The total area supported was 223,432 ha.			
Indicator 3 :	State policy and regulatory framework incorporate measures to conserve biodiversity, including strategies for invasive alien species and natural resources management.			
Value (quantitative or Qualitative)	No	Yes		Yes
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target achieved. Thirteen regulatory instruments designed and issued with the support of the Project with measures to conserve biodiversity. They are: (i) the native bees' state regulation; (ii) eight state regulations focusing on alien invasive species; (iii) the state decree on Grassland Conservation Index (*Índice de Conservação dos Campos Nativos – ICP – Indice de Conservación del Pastizal*); (iv) the state decree on the alien invasive species list; (v) the state decree on the state monitoring system; and (vi) the state decree on the creation of the Quarta Colônia Ecological Corridor. See: http://www.biodiversidade.rs.gov.br/portal			
Indicator 4 :	Areas brought under enhanced biodiversity protection (ha) (Core)			
Value (quantitative or Qualitative)	0.00	72,204 ha		223,432 ha.
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed the number of protected areas supported (110%) and the total area under protection (309%). This Bank Biodiversity Core Sector Indicator (CSI) was introduced during project implementation for corporate reporting requirement. Eleven protected areas were supported through the existing Biodiversity Conservation Program (*medidas compensatórias*) consolidating the protected areas in the biome. Nine of the 10 protected areas initially selected were supported. Two additional protected areas were supported: (i) Delta do Jacuí Environmental Protection Area (*Área de Proteção Ambiental* – APA) and (ii) APA Banhado Grande. Activities supported included: infrastructure investments, acquisition of equipment and durable goods; fencing;			

	environmental education; and enforcement. The total area supported was 223,432 ha.			
Indicator 5 :	Land users adopting sustainable land management practices as result of the Project.			
Value (quantitative or Qualitative)	0.00	500		610
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (122%). This Bank Biodiversity Core Sector Indicator (CSI) was introduced during project implementation for corporate reporting requirement. Total of 610 small and medium landholders – in the Pampa biome, landholdings with up to 200 ha are considered small and they prevail among the landholdings in the priority areas – have implemented on-farm subprojects (577), demonstration units (31) and validation units (2) fostering the adoption of sustainable land management practices with the support of EMATER/RS as result of the project. The sustainable management practices supported by the Project contributed to biodiversity conservation mainly by: reducing pressure of pastures planted with alien invasive species; controlling invasive species; restoring natural grassland landscapes; avoiding soil erosion; reducing pressure to deforest additional land for agriculture; providing habitat and resources for partially forest-dependent native plant and animal species that would not be able to survive in a purely agricultural landscape; and conferring suitability to landscapes as habitat for native fauna and flora. In addition, these sustainable management practices had positive impacts on the livelihoods of small landholders, by increasing productivity, diversifying production and providing alternative sources of income. In short, these practices have effects that reach beyond the limits of an individual agroforestry system and extend to the entire landscape.			

(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 :	12 Demonstration units implemented with selected farms or group of farms			
Value (quantitative or Qualitative)	0.00	12		31
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (258%). Thirty-one demonstration units (DUs) established on properties whose landholders have volunteered to conduct demonstration practices and were willing to share their experience with neighbors and other farmers under the extension activities carried out by EMATER/RS. The sustainable practices demonstration units piloted the following practices: sustainable grassland management (24 DUs); cropland-livestock- forestry management (4 DUs); livestock- forestry (1 DU); organic fruits production (1 DU); and, organic grain and vegetables production (1 DU). The Project also			

	supported the implementation of two validation units focusing on livestock-forestry management.			
Indicator 2 :	Around 2,000 producers participating in the project through training events			
Value (quantitative or Qualitative)	0.00	2,000		8,571
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (426%). In total, there were 8,571 rural producer participants in 174 training events promoted by the Project in the selected priority areas.			
Indicator 3 :	24 Municipalities (circa of 80% of the municipal area) with at least one technician for training in natural resource management.			
Value (quantitative or Qualitative)	0.00	24		33
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (125%). Eighteen capacity-building events were supported by the Project convening 434 participants in 43 municipalities, including all 33 municipalities in the four priority areas of the Project.			
Indicator 4 :	500 rural properties benefited with investments in productive activities that incorporate biodiversity conservation based on preliminary 10 practices.			
Value (quantitative or Qualitative)	0.00	500		577
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (115%). There were 577 on-farm subprojects implemented with the support of EMATER/RS, 31 demonstration units, and 2 validation units. The adopted sustainable practices were: (i) management of grasslands; (ii) agroforestry system management; (iii) livestock forest management; (iv) native bees' management; (v) organic fruits production; (vi) medicinal plants; and, (vii) organic grains and vegetable production.			
Indicator 5 :	10 state conservation units with improved management capacity by management plans and/or infrastructure.			
Value (quantitative or Qualitative)	0.00	10		11
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (110%). Eleven PAs were supported through investments in equipment, infrastructure to protect biodiversity, and management plans. Nine of the 10 Protected Areas initially selected were supported. Two additional Protected Areas were also supported: (i) Delta do Jacuí Environmental Protection Area (*Área de Proteção Ambiental* – APA), and (ii) APA Banhado Grande. The total area supported was 223,432 ha (more than three times the targeted area of 72,000 ha).			
Indicator 6 :	6 risk prevention plans developed and under implementation.			
Value (quantitative or Qualitative)	0.00	6		7

Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (117%). Eleven risk prevention plans were developed and seven are under implementation: (i) butiá project, (ii) ornamental plants project, (iii) Annoni grass project, (iv) grassland project; (v) Litoral Médio – Lagoa do Peixe project, (vi) Espinilho project; and (vii) native bees project. The following invasive species plans were developed: (i) wild boar; (ii) pine tree; (iii) *Axis* deer; and (iv) Quarta Colônia action plan.			
Indicator 7 :	Database on biodiversity, vegetation cover and other socio-economic factors operational and widely available			
Value (quantitative or Qualitative)	No	Yes		Partially
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target partially achieved. The Biodiversity Monitoring State System was established on November 27, 2014 by the State Decree 52.096. The database on biodiversity, vegetation cover and socio-economic factors is operational, but not publicly available. http://www.rs.gov.br/conteudo/208155/rs-passa-a-contar-com-sistema-de-monitoramento-da-biodiversidade/termosbusca=*			
Indicator 8 :	Four areas with Strategies for biodiversity conservation elaborated and under implementation by the State			
Value (quantitative or Qualitative)	0.00	4		4
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target achieved (100%). Four areas (Várzea do Ibicuí, Pedra do Segredo, Lagoa do Paurá, and Várzea do Quaraí) with ecological environmental assessments elaborated and biodiversity conservation strategies under implementation, totaling 415,691 ha. In addition, the Project advanced the preparation of the full Ecological and Environmental Zoning of the Litoral Médio region.			
Indicator 9 :	16% of priority area 1 (Quarta Colônia) with a conversation corridor proposed to the State Authorities			
Value (quantitative or Qualitative)	0.00	16		48.3
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target surpassed (302%). 48.3% of the priority area 1 (Quarta Colônia) was included within the Ecological Corridor (SEMA Ordinance 143, of December 16, 2014). The total Ecological Corridor area is 233.635,39 ha, including: (i) the core zone - 57,935.12 ha; (ii) the buffer zone - 75,550.26 ha; and, (iii) the transition zone -100,150.01 ha. The total area of the eleven municipalities of priority area 1 equals 483,743.60 ha.			
Indicator 10 :	Development of at least 40 educational and awareness events related to biodiversity aimed at 4 areas schools and specific groups, considering the local characteristics.			
Value (quantitative or Qualitative)	0.00	40		60
Date achieved	05/14/2009	01/01/2010		03/31/2016

Comments (incl. % achievement)	Target surpassed (150%). At the end of project, 60 educational and awareness-raising events were carried out by SEMA. They included 16 educational theater play enactments, 40 educational workshops, and four environmental education mini-courses.			
Indicator 11 :	63,000 inhabitants (40% of rural population form the four priority areas) informed about biodiversity and its importance for conservation through environmental education.			
Value (quantitative or Qualitative)	0.00	63,000		>63,000
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target achieved. The audience of face-to-face events included: 2,357 participants who attended workshops and seminars; 4,660 students and teachers attended exhibition of theater plays; 332 teachers enrolled on workshops and seminars; 8,800 high school students; 837 members of SEMA, FZB and FEPAM technical staff who participated in capacity building activities; and 8,571 rural producers who participated in training events. The Project also supported the International Seminar on the Pampa Biome: Biological, Cultural and Economic Values, which convened 400 participants. All of these total 25,557 participants in face-to-face events (41. percent of the target). In addition, the Project has produced and disseminated flyers, banners, educational notebooks, manuals, posters, and other technical and communication materials (162,500 hard copies have been printed and distributed). Fifteen publications have been produced and printed with the Project's support, 57,000 printed copies, and 3,000 DVDs of these publications have been publicly distributed. The Project has produced and broadcasted 66 educational television programs and 22 radio programs about biodiversity and conservation. These TV and radio shows have been broadcasted by 11 regional and statewide television and radio networks. These programs have been watched at least once by at least one hundred-thousand people. Finally, up to August 26, 2016, Project-related YouTube videos, Facebook and Twitter related dissemination materials reached 19,292 viewings.			
Indicator 12 :	Four State Institutions in charge of biodiversity conservation strengthened for policy implementation.			
Value (quantitative or Qualitative)	0.00	4		4
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target achieved (100%). Four State institutions that are in charge of environmental management (FZB, FEPAM, EMATER, and SEMA) were strengthened for policy implementation through training events, acquisition of equipment and durable goods (computers, vehicles, software, satellite images etc.), and the strengthening of the state regulatory framework concerning biodiversity conservation. In addition, the Project provided institutional strengthening for the state branches of two federal institutions (EMBRAPA and FEPAGRO). Institutional strengthening was understood as a set of different activities, including the provision of equipment, infrastructure and training, and the implementation of policy-dialogue activities aimed at promoting an enabling			

	environment for broader institutional innovations and organizational expansion to facilitate scaling up conservation activities.			
Indicator 13 :	Proposal for incentives promoting biodiversity conservation opportunities.			
Value (quantitative or Qualitative)	No	Yes		Yes
Date achieved	05/14/2009	01/01/2010		03/31/2016
Comments (incl. % achievement)	Target achieved. The Project supported the State Decree proposal on the Grassland Conservation Index (*Índice de Conservação dos Campos Nativos - ICP- Indice de Conservación del Pastizal*) – State Decree 51882, October 3rd, 2014. (http://www.alianzadelpastizal.org/proyecto-bid/componentes/ and http://www.birdlife.org/datazone/sowb/casestudy/700). This index measures conservation status of native grasslands in the Rio Grande do Sul State. The measurements of the Grassland Conservation Index are based on a few simple parameters, avoiding the need for expensive instruments. The aim is to promote its widespread geographical application, with the possibility of repeating the application each year to obtain a series of historical data to monitor the evolution of the natural grasslands. The Index calculates the percentage of natural grasslands within the total surface area of individual cattle ranches. It then measures the condition of that grassland by analyzing factors such as the genetic purity of the grassland in terms of the levels of alien versus native species. The Index also takes into account the scale of impacts from different types of agricultural land use, ranging from afforestation (the most impacting) to grass inter-seeding used for improving pastures (the least impacting). These values are entered into the formula of the Index according to the percentage of their use at each landholding. The Index is being tested with over 400 cattle ranchers across Uruguay, Argentina, Brazil and Paraguay to help safeguard grasslands. As it was officially established by State Decree 51882/2014, the Index will be applied when the state provides subsidies or incentives to rural producers engaged in state programs of grassland conservation. Nevertheless, the first measurements obtained from the application of the Index had not yet been made public at the time of the preparation of this ICR. In addition, the Project advanced a proposal on the valuation of environmental services for the Quarta Colônia priority area.			

G. Ratings of Project Performance in ISRs

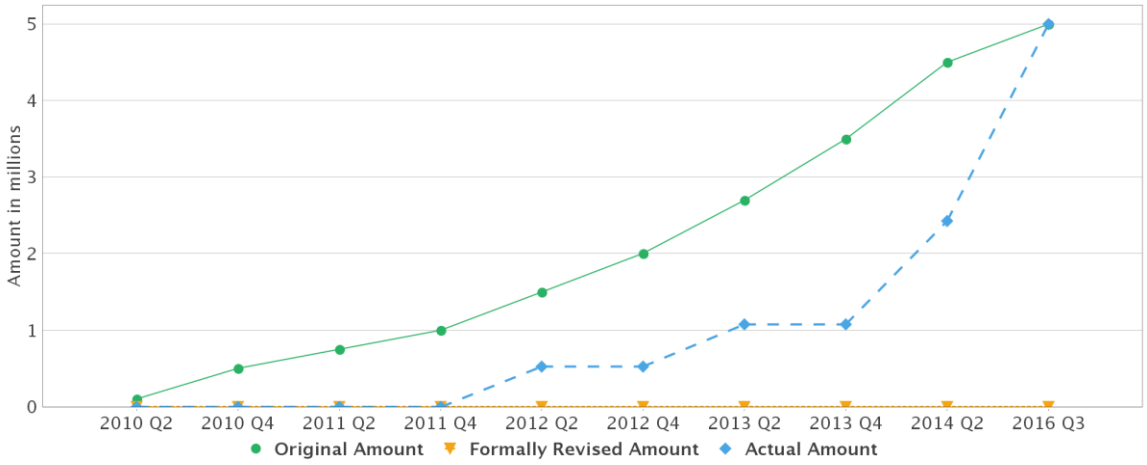
No.	Date ISR Archived	GEO	IP	Actual Disbursements (USD millions)
1	03/01/2010	Satisfactory	Satisfactory	0.00
2	02/23/2011	Moderately Satisfactory	Moderately Satisfactory	0.00
3	06/21/2011	Moderately Satisfactory	Moderately Satisfactory	0.00
4	12/27/2011	Moderately Satisfactory	Moderately Satisfactory	0.53
5	07/07/2012	Moderately Satisfactory	Moderately Satisfactory	0.53
6	01/19/2013	Moderately Unsatisfactory	Moderately Unsatisfactory	1.08

7	10/15/2013	Moderately Satisfactory	Moderately Unsatisfactory	1.93
8	04/05/2014	Moderately Satisfactory	Moderately Satisfactory	2.43
9	12/06/2014	Satisfactory	Satisfactory	3.13
10	06/17/2015	Satisfactory	Satisfactory	4.03
11	12/11/2015	Highly Satisfactory	Satisfactory	4.03
12	03/31/2016	Highly Satisfactory	Satisfactory	5.00

H. Restructuring (if any)

Restructuring Date(s)	Board Approved GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in US$ millions	Reason for Restructuring and Key Changes Made
		GEO	IP		
December 3, 2014	Not applicable	S	S	3.1	The key change introduced by this restructuring was a 13-month extension of the Closing Date. The reasons for this extension were to scale up activities already started, to fully complete financing of contracts under implementation and carry out an accounting of the Project' results and intermediary indicators.

I. Disbursement Profile



1. Project Context, Global Environment Objectives and Design

1.1 Context at Appraisal

The Brazilian Pampa – a Fragile Biome

1. Brazil is a mega-biodiverse country recognized as one of 18 countries that hold the majority of the world's plant and animal species. Brazil contains several important biomes and ecosystems, and boasts the richest biodiversity of any single country on the globe, with 15-20 percent of all known living species.

2. The state of Rio Grande do Sul (RS) is the southernmost state in Brazil and has a diverse topography. The variety of climates and soils endows the State with extremely rich ecosystems and ecoregions.

3. Rio Grande do Sul is also the only Brazilian state where the Pampa (grasslands) biome occurs. The Pampa Biome is located in the southern half of the state territory and occupies 176,496 km^2 or 63 percent of the state's total area (just 2.07 percent of Brazil's total area). The Pampa biome comprises at least seven different physiographic formations: savanna, steppe, steppic-savanna, coast, transition areas and patches of seasonal deciduous and semideciduous forests. It is the most unknown Brazilian terrestrial Biome.

4. As a very old collection of ecosystems, the Pampa is home to its own flora and fauna and presents high biodiversity. The Pampa`s grasslands support high levels of biodiversity and are considered one of the most globally significant areas for endemic birds. The grasslands contain 3,000 species of vascular plants, more than 60 mammal species, almost 500 birds, 30 reptiles, 20 amphibians and 40 inland waters fish species. The Pampa is home to 17 species of birds that are under threat of extinction and other 11 species classified as "near threatened".

5. The Pampa Biome also illustrates the direct and indirect interdependence of humans and biodiversity (Roesch *et all*, 2009[2]) and has gone through a process of intense land use change and degradation with the replacement of natural vegetation by rice paddy crops, soybean and forests of alien species in recent decades. In the state of Rio Grande do Sul, the natural grasslands are a source of forage for around 18 million animals – mainly cattle and sheep, and livestock production is one of the main economic activities. However, in much of the region, the soil has an extremely sandy texture due to its sedimentary rock origin. The geologic material makes the soils fragile and highly sensitive to water and wind erosion.

6. The Pampa Biome is the second most devastated biome in Brazil - the Atlantic Forest is the most degraded biome in the country. The natural fragility of the soil combined with the climatic conditions means that inappropriate human activities have led to intense soil degradation. The anthropogenic use of the land has changed the natural structure of the plant/animal communities, through introduction of alien grass species and conversion of native areas to agricultural lands, grazing areas and through the establishment of forest plantations. Thus in 2009, only 35.6 percent of the natural vegetation of the Pampa Biome remained,[3] leading to losses of both biodiversity and socio-economic opportunities.

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[2] Roesch et all, 2009. The Brazilian Pampa: A Fragile Biome. Diversity 2009, 1, 182-198.

3 Brazil, Ministry of the Environment. Secretariat of Biodiversity and Forests - SBF. Fifth National Report to the Convention on Biological Diversity: Brazil. Brasília: Ministry of the Environment, 2015. 1. Biodiversity – Brazil. 2. Convention on Biological Diversity – Brazil.

7. At the time of Project preparation, some critical drivers led to biodiversity loss in the grasslands. They included the accelerated land conversion due to forestry and the increase of plantations with alien tree species in natural habitats used for pulp production. They also included the prevailing cattle-ranching productive practices (overgrazing, continuous grazing, conversion to non-native pasture species), and the erosive processes associated with the removal of natural vegetation. Farmers' lack of knowledge and low technical capacity to adopt conservation practices, and a regulatory framework that was deficient to promote sustainable practices integrated with biodiversity conservation added to cause these deleterious effects.[4] Simultaneously, the sustainability of the agriculture sector and the livelihood of the rural poor largely depend on the natural resources and biodiversity of the Pampa Biome.

8. Thus, at the time of Project preparation, addressing the complex issue of the interaction between agriculture and biodiversity conservation was a key development and conservation challenge for the State Government of Rio Grande do Sul.

Project Background

9. In this scenario, the Project was designed aiming to contribute to protect natural habitats and biological diversity by:

- Strengthening state policies and the operational capacity of the institutions in charge of environmental management and rural development;
- Strengthening of the state protected areas system;
- Working mainly with rural producers in the cattle-ranching and forestry sectors to promote sustainable practices that could be integrated in agriculture activities leading to the reversion of marginal agricultural areas to forest; and,
- Enhancing knowledge about biodiversity conservation and sustainable rural production systems in the Pampa biome to provide a sound scientific basis for the development of a strong regulatory framework for the control of invasive alien species and the restoration and conservation of relevant sites and species.

10. As a pilot project, the strategy for working with rural producers in mainstreaming sustainable productive practices aimed to support a small number of landholdings and demonstration units as a basis to strong outreach and dissemination actions to educate potential beneficiaries on sustainable practices.

Project Priority Areas

11. The Project selected four priority areas according to four main criteria: (i) areas of extreme importance for biodiversity conservation according to the Brazilian Ministry of the Environment; (ii) occurrence of threatened ecosystems or species, (iii) existence of opportunities with potential incremental activities, and (iv) the occurrence of protected areas.

[4] Roesch L.F.W et all. 2009. The Brazilian Pampa: A fragile Biome. Diversity 2009,1, 182-198. Scurlock and Hall 1998. The Global carbon sink: a grassland perspective. Global Change Biology 4:229-233. Di Giacomo A. S. and Krapovickas, S. 2005. Conserving the Grassland Important Bird Areas (IDAs) of Southern South America: Argentina, Uruguay Paraguay and Brazil. USDA. Forest Service. Gen. Tech. PSW-GTR-1291. Overbeck, G.E. et al. 2007. Brazil's neglected biome: The South Brazilian Campos. Perspectives in Plant Ecology, Evolution and Systematics 9 (2007) 101-116.

12. The four selected priority areas were: (i) Quarta Colônia; (ii) Campos da Campanha; (iii) Escudo Sul-rio-grandense; and (iv) Litoral Médio. These four priority areas include 33 municipalities, which correspond to 6.7 percent of RS municipalities and 22.5 percent of its territory (63,429km^2). The rural population in the Project area counted 157,887 inhabitants at the time of Project preparation and represented 9.2 percent of the rural population of the state. Within this area, there were 39,594 rural properties (9.0 percent of the state's rural landholdings), comprising an area of about 4.9 million ha (24.1 percent of the rural area in the state). Most of the landholdings (81.5 percent) held less than 200 ha and were considered small landholdings according to parameters set for the Pampa Biome. Ranching (beef and milk production) was the main productive activity of more than 86 percent of these small landholdings. Annex 8 presents a map of the four priority areas.

1.2 Original Global Environment Objectives (GEO) and Key Indicators

13. As originally approved and expressed in the Grant Agreement, the Project objective was: "To promote the conservation and restoration of biodiversity in the state's grassland ecosystem in the Rio Grande do Sul's territory by mainstreaming biodiversity conservation within the forestry, agriculture and livestock productive landscapes."

14. The Project Appraisal Document (PAD) states that the project GEO would be achieved through:

- Promoting actions that assist farmers to restore and maintain priority areas for biodiversity conservation, where ecosystem fragility and threats to biodiversity occur;
- Conserving biodiversity by strengthening the implementation of public policies that enhance the development of improved management systems and production practices, including creating awareness and building institutional capacity; and,
- Securing the functions, dynamics and evolution of threatened ecosystems and endemic species while consolidating the network of protected areas within the biome.

15. Three key indicators were defined to measure progress towards the GEO:

- 500 rural properties with biodiversity conservation practices at the farm level in the *Pampa* (grasslands) biome;
- State conservation units' system improved with management plans and infrastructure of 10 conservation units, totaling 72,000 ha, under protection; and,
- State policy and regulatory framework incorporate measures to conserve biodiversity, including strategies for invasive alien species and natural resources management.

1.3 Revised GEO (*as approved by original approving authority*) and Key Indicators, and reasons/justification

16. The GEO and the Key Indicators (in the grant agreement) were not revised.

17. Nevertheless, in 2014, two additional Core Sector Indicators (CSI) were introduced for corporate reporting requirements. The additional core sector indicators are, respectively: (i) areas brought under enhanced biodiversity protection; and (ii) land users adopting sustainable land management practices as result of the Project. They are complementary to key indicators *500 rural properties with biodiversity conservation practices at the farm level*

in the Pampa (grasslands) biome and *State conservation units' system improved with management plans and infrastructure of 10 conservation units, totaling 72,000 ha, under protection*, respectively. Important to note that these two additional indicators are not stated in the PAD.

1.4 Main Beneficiaries

18. The Project benefited a wide variety of stakeholders.

19. *Family Farmers*[5] in the priority areas directly benefitted from the Project's support to the implementation of on farm productive practices and experiences in demonstration units. This group of stakeholders received on a pilot basis partial financing and technical assistance for the adoption of sustainable management practices within productive landscapes. Family farmers also directly benefitted from the Project`s support to environmental education and awareness-raising activities and campaigns. In the 33 municipalities located within the four priority areas, there were 39,594 landholdings comprising about 4.9 million ha of land. They counted for 9.0 percent of the landholdings in the state of Rio Grande do Sul and their landholdings comprised 24.1 percent of the rural areas in the state. The average size of their landholdings was 123.52 ha, whereas the state average size of rural landholdings was 46.04 ha. In the Pampa biome, landholdings up to 200 ha are considered small landholdings and, consequently, small landholdings counted for 81.5 percent of the landholdings under the Project and held just 23.3 percent of the land in the four priority areas. About 86.0 percent of these small landholdings relied on ranching (beef and milk production) as their main source of livelihood.[6]

20. *Producer organizations and other producers' groups* indirectly benefited from training and institutional strengthening activities as well as the dissemination of lessons learned and sustainable production techniques adopted in the pilot and demonstration units supported by Component 1 (On-Farm Biodiversity Mainstreaming). These organizations participated intensively on Project design and implementation through participatory workshops.

21. *Government agencies and staff* – including those in institutions not traditionally involved with biodiversity conservation, who received technical training to allow them to promote the objectives of the Project – benefitted from the improved regulatory framework, the large production and dissemination of scientific knowledge about the Pampa biome, technical training, and institutional strengthening through increased resources and enhanced structures dedicated to conservation.

22. *Non-government organizations (NGOs) and private sector firms* that rely and/or provide services or products related to conservation also benefited from training activities, the large production and dissemination of scientific knowledge about the Pampa Biome, and

[5] Family farmers refer to small and medium-sized rural producers whose production system and livelihood is based mostly on the use of family workforce, highly dependent on strong relations with the physical environment, and express an autonomous way of life marked by risk aversion. Federal Law 11326/2006 defines "family farmers" as those who do not hold, in any capacity, land areas larger than four fiscal modules, mostly employ the labor force of their families in their economic activities in their landholdings, and have a minimum percentage of their household income steaming from their agrarian, pastoral and/or forestry activities.
[6] IBGE, Agrarian Census 2006. Available at http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/default.shtm.

the dissemination of lessons learned and sustainable production techniques adopted in the pilot and demonstration units supported by the Project.

23. *Local residents o*f biodiversity-rich areas benefitted from environmental education and awareness-raising activities and campaigns, the increased capacity of extension agents and other government staff, increased resources and technical knowledge for conservation, and eventually greater environmental benefits from improved ecosystem services such as, reduced presence of agrochemicals, soil conservation, and availability of additional natural resources.

1.5 Original Components

24. As originally approved, the Project consisted of three components:

25. **Component 1: On-Farm Biodiversity Mainstreaming** (Total cost: US$ 2.36 million; GEF: US$ 1.85 million). Rationalize land conversion processes by promoting the adoption of biodiversity conservation practices in the main productive systems of the grasslands. This was accomplished through two subcomponents.

> ***Demonstration units***: Facilitate sound management and conservation practices for selected farms or groups of farms in Project priority areas. These demonstration units should be established on properties that have volunteered to conduct demonstration practices and were willing to share their experience with neighbors and other landowners under the extension activities carried out by *Associação Rio-grandense de Empreendimentos de Assistência Técnica e Extensão Rural* (EMATER/RS).
>
> ***Subprojects implementation*:** Support the implementation of a variety of conservation and sustainable productive practices in rural properties within the Project`s priority areas. At least 500 rural properties should receive investments supporting biodiversity conservation and sustainable production practices under guidance of EMATER/RS and based on the experiences of the demonstration units.

26. **Component 2: Biodiversity Management** (Total cost: US$ 7.22 million; GEF: US$ 2.50 million). The objectives of this component were twofold. First, it aimed to strengthen the capacity of four State institutions responsible for promoting biodiversity conservation and responsible use of the biodiversity in the grasslands.[7] Secondly, it aimed to undertake activities, funded by resources from the state-run Compensatory Measures program, for the conservation of threatened species as well as improving the management capacity and infrastructure within 10 protected areas in the Project area. The objectives were accomplished through three subcomponents:

> ***Protecting species and sites* –** Expected outputs: four rapid ecological assessments (REAs) and action plans for relevant species/sites developed; technical studies and events for exchange of information carried out; the delineation of the conservation corridor of the Quarta Colônia (as part of the Atlantic Forest Biosphere Reserve) defined and an action plan designed and implemented; the state system of conservation units

[7] The four state institutions targeted by strengthening investments are the Secretariat of the Environment and Sustainable Development (SEMA); the State Foundation for Environmental Protection (FEPAM); the Zoo-Botanical Foundation (FZB); and, the Technical Assistance and Rural Development Enterprise (EMATER/RS).

within the grasslands consolidated according to the priorities required for their strengthening (e.g., infrastructure, management plans).

Improving the State's regulatory framework and promoting institutional strengthening – Expected outputs: a study based on analytic models for economic valuation of biodiversity management for the development of payments for environmental services completed; strategies for private land stewardship initiatives and incentives for biodiversity conservation practices developed; appropriate training for operational and managerial staff in the various state agencies provided, thereby helping to ensure sustainability of the Project's impacts after implementation.

Increasing environmental awareness and promoting information on biodiversity. Aiming to promote and speed biodiversity information through a formal educational network and local interest groups within priority areas, the expected outputs of this component include: educational materials for children and for teachers prepared, produced and disseminated; educational events and communication campaigns conveyed; assessments of the biome's environmental and social status carried out; equipment acquired, training and technical assistance provided to improve the management and oversight with regards to agro-ecological zoning and licensing as well as development of economic incentives for biodiversity conservation.

27. **Component 3: Project Management** (Total cost: US$ 1.21 million; GEF: US$ 0.50 million). Component 3 provided support, including technical assistance and equipment, for coordination, management and monitoring activities under the Project to the Project Implementation Unit (PIU) to carry out all managerial and operational procedures as well as external communication needed to coordinate, to implement and to monitor the Project.

1.6 Revised Components

28. Not Applicable. Components were not been revised.

1.7 Other significant changes

29. The Project underwent one closing date extension, from February 28, 2015 to March 31, 2016. This extension was based on the official request from the government of Rio Grande do Sul, dated March 24, 2014; and the endorsement of the Brazilian External Finance Commission (COFIEX), dated July 9, 2014.

30. The reason for this extension was to scale up the ongoing activities, to disburse in full the contracts under implementation and to carry out a broad evaluation of the Project's results.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

31. *Project Preparation.* Project preparation started in 2004 and was supported by a Grant Agreement (US$ 349,488) signed between IBRD, acting as implementing agency of the Global Environment Facility, and the State of Rio Grande do Sul. This Grant Agreement closed on October 31, 2007 after two extensions of the closing date. The Grant Agreement supported biome-level assessments, extensive consultation workshops with key stakeholders,

and specific studies.[8] The Project was originally conceived as a US$ 17 million operation, of which US$ 7.5 million would be funded through a GEF grant and the remaining with co-financing from the Rio Grande do Sul State government. The Project would complement the RS Integrated Regional Development Investment Financing Loan that was being prepared by IBRD at the time. This combined IBRD/GEF Project proposal would promote biodiversity conservation in the rural environment by combining agricultural, forestry and livestock activities within a holistic context of ecosystem and natural resources management. During Project preparation, the total amount to be supported by the GEF was reduced. In parallel, the IBRD loan was dropped. Thus, since 2007, Project preparation was carried out based on a standalone GEF Trust Fund. The Decision Meeting was held on April 29, 2009. GEF Endorsement letter was received on October 21, 2009. Board Approval occurred on December 22, 2009. Effectiveness was on February 23, 2011.

32. *Assessment of Project Design*. 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 operations including the importance of recognizing the expertise and views of local people and creating a sense of shared ownership of resources and obligations. 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 on the grasslands as well as of a communication strategy to ensure transparency and results dissemination. Finally, they stressed the relevance of the provision of technical assistance by local technicians during and beyond the duration of the Project for achieving sustainable, long-term impacts.

33. To address the main drivers of biodiversity loss in the grasslands, Project design was based on two primary pillars: (i) helping private landowners in rural areas to adopt biodiversity-friendly conservation practices, and (ii) providing the public sector with the tools needed to promote conservation and to create an enabling environment for biodiversity integration. The first pillar focused on promoting actions to adopt biodiversity-friendly production systems based on the capacity of the State agency responsible for technical assistance and agricultural extension (EMATER/RS) in the grasslands. The second pillar worked with biodiversity authorities of the State to reduce threats to globally important species and sites and cover the gap of knowledge for biodiversity conservation and management actions.

34. To deal with these two pillars, the Project relied on a complex institutional arrangement. Five state agencies and one non-governmental organization – the State Secretariat of the Environment and Sustainable Development,[9] the State Foundation of Environmental Protection,[10] the Zoobotanic Foundation,[11] the Technical Assistance and Rural

[8] These studies and assessments include: an analysis of existing public policies and programs affecting the Pampa ecosystems and of the policy and regulatory adjustments needed; the selection of priority areas and baseline studies, including the social and environmental assessment; a diagnosis of current state-of-the-art and needs for developing a land use planning process; the mapping of regeneration and restoration needs in areas relevant to conservation; and an analysis of agro-forestry systems (including pastoral initiatives).
[9] Secretaria Estadual do Ambiente e Desenvolvimento Sustentável - SEMA.
[10] *Fundação Estadual de Proteção Ambiental* – FEPAM.
[11] *Fundação Zoobotânica* – FZB.

Development Enterprise,[12] and The Nature Conservancy of Brazil – worked as implementing agencies. A State Steering Committee[13] was created to monitor Project implementation. Consultations with local stakeholders were a key part of the Project approach for planning and implementing strategies and conservation efforts. The Implementation Completion and Results Report (ICR) considers that, although complex, this institutional arrangement for implementation was essential for reaching Project results and objectives, because biodiversity conservation in the grasslands requires a mix of activities combining the protection of set-aside conservation areas, the improvement of agriculture outcomes, awareness raising campaigns and advocacy for new legislation.

35. *Participatory Processes.* Project preparation followed a highly participatory process. The participatory preparation process convened eight rounds of consultations with the participation of a wide range of stakeholders residing in the Project area and groups with a specific interest in the region, including representatives from at least ten governmental and non-governmental organizations with a stake in biodiversity conservation. Consultations and workshops were held in different areas of the state and a final consensus-building workshop was held in the State's capital, Porto Alegre.[14]

36. *Assessment of risks.* The Project's risk assessment was successful in identifying the most relevant risk factors facing the operation and in proposing effective mitigation measures. The assessment accurately stressed that market demands for grassland's agricultural products and lack of familiarity on the part of the beneficiaries with Project instruments could constrain the adoption of sustainable land use practices. Beneficiaries could consider that these practices were unable to generate economically viable returns and, consequently, unsustainable acceleration of land conversion could continue. In response, the Project implementation strategy relied on beginning with pilot demonstration units with the sustainable production practices and landscape management, strong emphasis on outreach and dissemination to educate potential beneficiaries on Project activities, and participatory approaches for the selection of subprojects based on their environmental and economic viability.

37. The risk assessment also pointed out challenges related with political changes in State government that could reduce political support and consequently government's commitment to the Project as well as interinstitutional coordination and lack of familiarity with IBRD's fiduciary procedures, which could hamper implementation capacity and result in delays in achieving the Project's objectives. To mitigate these risks, the Project relied on an institutional arrangement that was complex, but able to promote ownership among a broad range of stakeholders and ruled by detailed definitions of institutional roles, responsibilities, and objectives. Under this institutional arrangement, the State Secretariat of Environment and Sustainable Development (SEMA) centralized and managed activities related to the overall Project management, financial administration, monitoring and coordination with partners.

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[12] *Associação Rio-grandense de Empreendimentos de Assistência Técnica e Extensão Rural* – EMATER/RS.

[13] The Steering Committee had representatives from the implementing agencies and other stakeholders (municipalities, Regional Development Councils, rural labor unions, NGOs, Federal and State Environmental Agencies).

[14] http://www.biodiversidade.rs.gov.br/arquivos/1303154547. Apêndice III - Relatório dos Workshops Locais de Preparação do Projeto RS Biodiversidade – Dezembro de 2005/Janeiro e Fevereiro de 2006.

38. Furthermore, the Project staff received training in fiduciary management and the IBRD carried out procurement supervision missions regularly. Finally, the risk assessment emphasized macroeconomic risks related to potentially inadequate responses to external shocks due to slow progress on fiscal reforms, in spite of the sound country economic environment at the time of preparation. The ICR considers this risk assessment was accurate.

2.2 Implementation

39. The GEF Rio Grande do Sul Biodiversity Project was approved on December 22, 2009. The Project Implementation Unit (PIU) and the Steering Committee's regulations were adopted and published on November 23, 2010. The implementing agencies formalized their cooperation agreements to implement the Project in February 2011. Project effectiveness was declared on February 23, 2011. The PIU staff was formally nominated by SEMA, through Decree Number 11, dated of March 29, 2011.

40. The Project faced a few challenges in its initial phase of implementation. Between 2011 and 2014, there were four different Secretaries heading SEMA, which had impacts on the allocation of staff and the continuation of institutional arrangements. On March 28, 2012, SEMA's headquarter was affected by a fire, which compromised the activities of the Project while staff were being transferred to a new and permanent place. Furthermore, during the first two years of implementation the PIU was understaffed. Only three staff members had been assigned to the PIU and they were not sufficient to implement Project activities successfully and at a regular pace. These stressors delayed Project implementation as reflected in the Implementation Status and Results Reports (ISRs), which rated Implementation Progress as Moderately Unsatisfactory at that stage.

41. Moving forward since March 2012, the Project implementation consistently improved. In 2014, it had reached a good pace, with the necessary SEMA staff working in the Project, properly trained by IBRD, and capable of executing Project activities successfully. The pace of Project implementation sped from 2012 as a consequence of three factors. First, early dissemination, communication, awareness raising and stakeholders engagement campaigns paid off and more on-farm activities took place in response to increased interest by rural producers in more sustainable productive practices (as shown in the following table). Second, the supported studies and assessments progressed. Finally, the internal capacity of the PIU increased as a result of the institutional strengthening/capacity building training provided on fiduciary issues.

Table 1. Evolution of the Implementation of Component 1.

Years	Number of On-Farm subprojects		Amount of Funds	
	Absolute	Percentage of total number of subprojects	Absolute (Brazilian Reais)	Percentage of total amount of funds
2102	59	10.1%	$ 281,276.00	8.9%
2013	261	44.6%	$ 1,269,178.00	40.1%
2014	539	92.0%	$ 2,930,072.00	92.5%
2015	581	99.2%	$ 3,139,412.00	99.1%
2016	586	100.0%	$ 3,167,570.00	100.0%

42. A Mid-Term Review Mission (MTR) was carried out in December 2013. At the time of the MTR, implementation was slower than expected. Given initial delays, grant disbursements totaled 38.6 percent. The IBRD team reviewed the implementation progress of each component and the progress towards the Project's development objective. The IBRD

team and the PIU worked closely and agreements were reached on the necessary adjustments to improve the Project`s implementation pace as well as to accelerate disbursements. The IBRD team also discussed a possible extension of the closing date of the Project.

43. In March 2014, the State government requested a closing date extension of 18 months to scale-up the activities, fully disburse the contracts under implementation and to carry out a broad evaluation of the Project's intermediary indicators and results. Based on this request, the IBRD and PIU teams discussed the possibility of upscaling Project expected targets on the number of subprojects and demonstration units. Considering the political and financial instability in the state of Rio Grande do Sul at the time, it was agreed that it would be more appropriate to maintain the Project targets as agreed in the PAD and extend the Project by only 13 months.

44. The Brazilian External Finance Commission (COFIEX) endorsed the official request for the extension of the closing date in July 2014. In December 2014, the Project underwent a Level 2 restructuring process and its closing date was extended from February 28, 2015 to March 31, 2016.

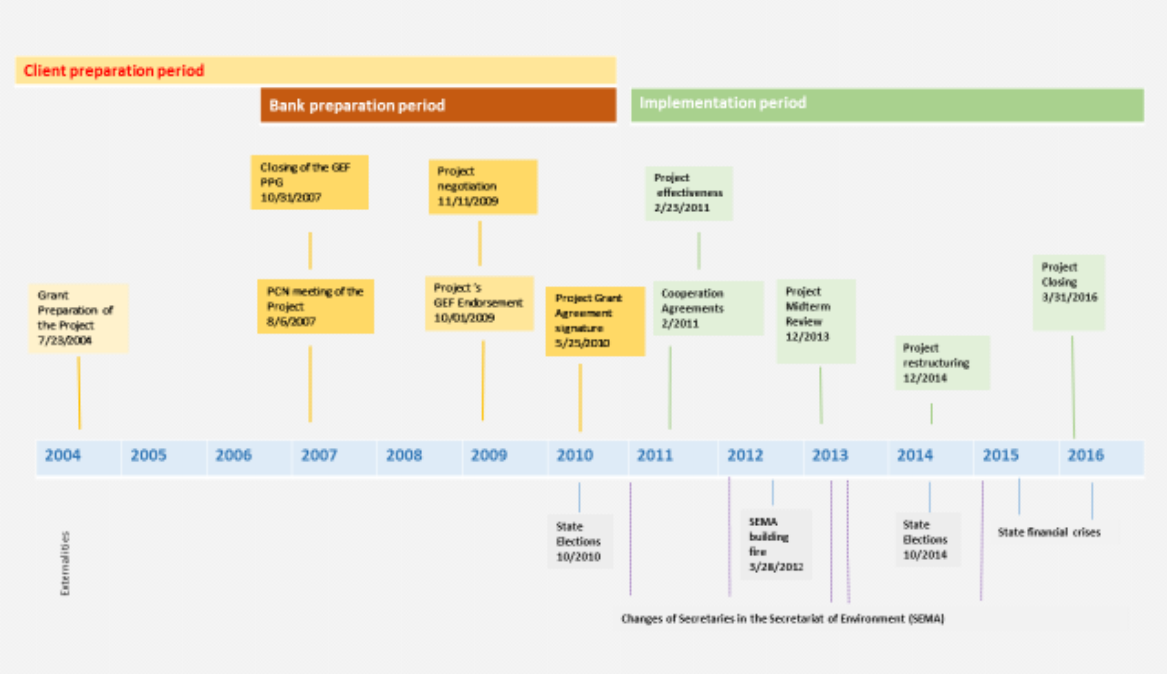
45. An external factor that influenced the Project implementation was the exchange rate fluctuation between US dollar and Brazilian Real (R$). During the last nine months of Project implementation, the Brazilian currency was highly depreciated. The exchange rate effective on February 23, 2011 was RS$ 1.67 per US$ 1.00. In September of 2015, the Brazilian Real fell to its lowest level in its history at an exchange rate of 4.07 per US dollar and on March 30, 2016, the Brazilian Real closed the day at 3.60 per US dollar. The exchange rate fluctuation allowed for some additional activities, such as travels and hiring of local consultants, but the timing of its occurrence relative to the stage of Project implementation did not allow an increase of targets. The exchange rate level was a key consideration not just for procurement activities, but also regarding the overall disbursement rate. It also negatively affected the acquisition of computers and software. The Project's Procurement Plan was often updated to incorporate or cancel acquisitions and review costs. Inspite of this fluctuation, at the Project closing date, the grant funds were fully disbursed.

46. The ICR highlights that the financial execution of counterpart funds directly through the state system of compensation measures was much lower than initially envisaged. Compensatory funds' investments for strengthening the State System of Protected Areas reached US$ 924,243.40, only 32.2 percent of the planned value. In spite of this, 11 rather than ten Protected Areas received support from the Project and they comprise an area equal to 223,432 ha, which corresponds to three times the originally envisaged Project target and 30.6 percent of the area under protection in the Rio Grande do Sul state.

47. Project implementation gave priority to communication and participatory processes. Communication efforts (flyers, twitter, Facebook, videos, news, educational events, website, stickers, radio programs, manuals, etc.) played an important role to engage private landowners on on-farm sustainable practices, as well as to reach an agreement on the design and proposal of the Quarta Colônia Ecological Corridor. In 2012, four workshops were held to discuss Project activities and to engage local stakeholders. Stakeholders have participated in different ways: on the Project's Steering Committee, on consultative committees, policy proposals, productive subprojects, studies, environmental education events, among others. Partnerships with universities, municipalities, research institutions, and civil society were created or strengthened. For further information see: http://www.sema.rs.gov.br/

48. The Project's overall risk was consistently rated as **Moderate** in the ISR throughout Project implementation, a rating with which this ICR agrees.

49. The figure below summarizes the milestones on Project preparation and implementation.



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

50. *M&E design.* As mentioned earlier, the Project preparation started in 2004, as a blended operation with an investment project financing loan, and the Project was initially designed to be a larger operation.

51. In line with GEF objectives, and following the then practice of setting long-term results as the PDO/GEO, the Project's PDO/GEO focused on a long-term outcome: promote conservation and restoration of biodiversity in the grassland ecosystem. The PDO/GEO comprises two main parts: (i) promote conservation and (ii) promote restoration. A third part of the PDO is also important and defines the way through which these objectives would be achieved - namely: by mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes.

52. Project design took into consideration the importance of the natural resource base for economic development, the relevant investment opportunities in the agricultural and non-agricultural sectors, and the different groups of stakeholders that should be engaged to achieve the Project's higher objectives. The Project's theory of change figure, shown in Annex 2, describes the linkages between these PDO parts and Project pillars, intermediate outcomes indicators, and expected impacts. The project design was based on two primary pillars and presumed that by (i) helping private landowners in rural areas to adopt biodiversity-friendly conservation practices and (ii) providing the public sector with the tools needed to promote conservation and to create an enabling environment for biodiversity integration, the Project would lead to effective biodiversity conservation and restoration in grassland ecosystems.

53. The Monitoring and Evaluation (M&E) system was designed as a participatory system to include feedback from local communities living in the priority areas of the Project. The design of M&E involved Project progress monitoring (managerial monitoring) to manage the implementation schedule of planned activities and to evaluate the adequacy of schedule and execution, based on the Project's Results Framework.

54. The achievement of the PDO/GEO parts were monitored and measured according to three Project Outcome Indicators:

Part 1: Promote conservation of biodiversity
The associated indicator was: State conservation unit system improved with management plans and infrastructure of the at least 10 conservation units, totaling 72,000 ha under protection.

Part 2: Promote restoration of biodiversity
The associated indicator was: 500 rural properties with biodiversity conservation practices at farm level in Pampa Biome.

Part 3: Mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes
The associated indicator was: State policy and regulatory framework incorporate measures to conserve biodiversity, including strategies for invasive alien species and natural resource management.

55. These indicators were based on outputs that capture information on a proxy form. For instance, protected area coverage is considered a proxy for biodiversity, but it is not a means to actually measure effectiveness in reducing biodiversity loss. Despite being proxy indicators, they (or the combination thereof) provide a robust assessment of Project's contribution to biodiversity conservation and restoration in the grassland ecosystems of Rio Grande do Sul. Annex 2 describes the assumptions, approaches, outputs, and potential biodiversity conservation outcomes of each Project's component.

56. Since Project approval in 2009, the IBRD's operational procedures to design, implement, and use indicators evolved and core indicators were introduced by each IBRD sector and became mandatory. Thus, since 2014, ISRs included two additional indicators: (i) areas brought under enhanced biodiversity protection, and (ii) land users adopting sustainable land management practices as result of the Project. They are complementary to the original key indicators "500 rural properties with biodiversity conservation practices at the farm level in the Pampa (grasslands) biome" and "State conservation units' system improved with management plans and infrastructure of 10 conservation units, totaling 72,000 ha under protection", respectively.

57. The Project's Results Framework also contained 13 technical intermediate indicators. At times, the Project outcome indicators and intermediate outcome indicators overlap. For instance, "10 protected areas improved with management plans and infrastructure" is a Project outcome indicator as well as an intermediate outcome indicator, although there are some minimum differences in wording between the two indicators.

58. Further complicating the M&E design, capacity building, communication, and education and awareness campaigns were critical indicators of the Project, but it was not established how to measure their effectiveness. As a result, there are neither indicators, nor benchmarks to monitor the progress of individuals and/or organizations as they acquired or enhanced capacities and awareness.

59. The ICR considers that M&E design could be simpler with a PDO/GEO less ambitious and more feasibly achievable during the Project life.

60. *M&E Implementation*. The M&E system was under the responsibility and coordination of the PIU, which hired a consultancy to design and continuously update a Project database and, later in Project implementation, developed a mechanism to track repercussion of Project supported activities in the social media. The PIU successfully delivered the required technical implementation reports (9 reports in total) and one completion report, including evidences of outputs and quantitative and qualitative data.

61. The M&E system performed as expected, adequately collecting data to track Project progress and report on implementation, applying the indicators defined in the PAD. All Project's outputs and evidences for each activity[15] have been gathered and properly recorded, including individual monitoring of each subproject. The M&E system collected and compiled outcomes, results and progress towards Project's targets and successfully tracked the Project's Results Framework. In addition, following GEF procedures, the Project adopted the GEF-4 Tracking Tool for GEF Biodiversity Focal Area Strategic Objective Two: Mainstreaming Biodiversity Conservation in Production Landscapes/Seascapes and Sectors. Along implementation, the GEF Tracking Tool was applied three times to each Protected Area supported by the Project to assess evolution and improvements in biodiversity conservation.[16] Two technical reports have been prepared by the Client in addition to the periodic implementation reports: one for the Project's Mid-Term Review and another as a final evaluation of Project's implementation - the findings of this last assessment are critically incorporated throughout this ICR.

62. *M&E Utilization.* The M&E system was used to monitor outputs and outcomes, including attitudinal changes with regard to biodiversity conservation and management among Project beneficiaries. The M&E information was adequately used by the IBRD and Project teams to solve/attempt to solve problems that arose during implementation. This use is reflected in the twelve ISRs and at the Mid-Term-Review held in December 2013 when the IBRD team reviewed the implementation progress of each component and the progress towards the Project development objective.

63. Objectives and outputs of the Project have been effectively communicated through different means and information technologies, and social media have been proactively used as envisaged in Project design to secure feedback in real time for appropriate decision-making and management action adjustments, as well as to secure transparency and dynamism.

64. The PIU organized 24 events open to the public to disseminate the results of the Project in the state capital (Porto Alegre) and at the four priority areas. In total, 2,357 participants attended these events. Project implementation gave priority to communication and participatory processes. Communication efforts used a number of instruments to engage

[15] These include lists of participants in Project supported events, socioeconomic data of family farmers involved in subprojects and demonstration units, and basic information on the policy regulations issued with the support of the Project.

[16] The Tracking Tool was applied at CEO endorsement, at project mid-term, and at project completion. The tracking tool is available at https://www.thegef.org/gef/BD_tracking_tool.

with citizens and civil society (flyers, Twitter; Facebook, videos, news, educational events, website, stickers, radio programs, manuals, etc.).

65. Upon Project completion, the reports and assessments prepared included information obtained from consultations with landholders and implementation agencies, and the findings of those assessments are incorporated throughout the ICR.

66. In terms of M&E utilization, the ICR concludes that a significant and consistent amount of data was produced and adequately used by the Project Team and IBRD to improve implementation.

2.4 Safeguard and Fiduciary Compliance

Safeguard Compliance

67. This Project was classified by IBRD as a Category B Project, given that its impact was limited in scope, localized, temporary and reversible. The Project triggered the safeguard policies of Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), Indigenous Peoples (OP/BP 4.10) and Physical Cultural Resources (OP/BP 4.11).

68. Measures taken to address safeguard policy issues included the preparation of an Environmental and Social Impact Assessment (ESIA), an Environmental Management Framework (ESMF), a pest management framework (as part of the ESMF) and an Indigenous Peoples Policy Framework (IPPF).[17]

69. During Project implementation, no significant negative social and environmental impact were identified. The overall activities supported by the Project led to positive impacts on the environment, such as the recovery of natural habitats and the control of invasive species. The implementation of all subprojects and demonstration units in Component 1 (On-Farm Biodiversity Mainstreaming) complied with the overall Project safeguards framework and with federal and state laws and specifically addressed the issue of natural habitats, as defined by OP/BP 4.04.

70. Project activities did not interfere with any Indigenous Land, but benefited a number of Quilombola (traditional Afro-descendants) Communities, which are among the most vulnerable population in rural areas of Rio Grande do Sul. As the Project aimed to enhance the use of more sustainable productive practices by private landholders, it focused on private landholders. Indigenous Lands do not fit in this definition.

71. Compliance with safeguard policies was assessed regularly by the IBRD team and reflected in the ISRs throughout the Project life, which consistently rated safeguard compliance as Satisfactory. This ICR agrees as there are evidences that the safeguards triggered were handled in an appropriate manner.

[17] The Bank received the Environment Assessment and the Indigenous Peoples Policy Framework on November 30, 2007. The documents were disclosed in country by the Recipient on December 17, 2007; and sent to the IBRD's InfoShop on November 7, 2008.

Fiduciary Compliance

72. The Project is considered to have complied with the IBRD's fiduciary policies and guidelines.

73. IBRD's procurement and Financial Management (FM) specialists regularly carried out expenditure and post procurement reviews. Issues raised by these reviews were clarified and efficiently resolved. As a result from training provided by IBRD's procurement and FM specialists, the PIU procurement and financial capacity management significantly improved during the Project life. The PIU maintained detailed accounts throughout implementation of the Project and submitted progress reports on a regular basis to the IBRD.

74. The Bank and client worked together and identified a potential fraud incident in FY2015. This event was flagged by the PIU and further reviewed by the Bank's Procurement Specialist. The issue led to an Institutional Integrity Vice-presidency (INT) investigation that resulted in the substantiation of allegations, and the Task Team offered its assistance as needed. For further information, see section 5.1 Bank Performance (b) Quality of Supervision.

75. The initial projects annual audits (FY11 and FY12) had a qualified opinion, mainly to minor findings from the auditors, given the projects inexperience. The Supreme Audit Institution - SAI (TCE-RS) provided recommendations, and the project implemented a successful action plan. The remaining audit reports (FY13 and FY14) all had an unqualified (clean) opinion, consistently expressing the opinion that financial and accounting management were well organized and that accounting documents were well maintained.

76. The latest Portfolio and Risk Management (PRIMA) Assessment rated the Project's financial management as Satisfactory. While the procurement capacity was considered Moderately Satisfactory during early implementation, since 2014 and as result of training and additional assistance provided to the Project team, procurement management was rated as Satisfactory until the end of the Project's life.

2.5 Post-completion Operation/Next Phase

77. Four well-established state institutions in charge of environmental management and rural development have participated in and benefited from the Project. Their operational capacity was strengthened by the training activities, acquisition of equipment and durable goods and enhanced regulatory framework that has been advanced by the Project. Above all, the expanded knowledge-base and the strengthened state's regulatory framework – concerning invasive alien species, the delineation of an ecological corridor, the monitoring of biodiversity in the grasslands, and biodiversity conservation of special sites and species – are a major legacy of the Project. These outcomes will enhance the work of state agencies in charge of biodiversity conservation in such critical areas as the licensing of extracting and agroforestry activities among others. In this context, they will continue to exercise their mandated functions upon completion of the Project with improved capacity as well as with broader social and political support.

78. Since 2012, the World Bank is supporting the implementation of the investment project financing (IPF) operation Rio Grande do Sul SWAp Project (P120830). The development objective of the project is to improve public investment planning and implementation by strengthening the capacity of the state planning agency and selected sector

secretariats. The Rio Grande do Sul SWAp project provides crosscutting technical assistance in public investment and human resource planning, procurement management, contract management, impact assessment, environmental and disaster risk management and citizen participation in decision-making.

79. Building on the experience provided by the RS Biodiversity Project, the Rio Grande do Sul SWAp project is supporting the continuation of institutional capacity building and institutional development on environmental management. As part of its environmental management, the Rio Grande do Sul SWAp Project is financing technical assistance with focus on ecological-economic zoning and environmental licensing and public communication.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

Relevance of Project Objectives

80. Project objectives were highly relevant at the time of preparation and remained relevant during implementation and at exit and is rated **High**. The Project was consistent with:

- The guidelines and decisions of the Conference of the Parties (CoP) to the Convention on Biological Diversity, of which Brazil is signatory, regarding conservation and sustainable use of biological diversity;
- Brazil's commitments to achieve the Millennium Development Goals (MDGs), specifically MDG 7, covering environmental sustainability; and,
- The recommendations of the World Conservation Congress held in Barcelona (2008), in which members approved a specific motion calling on countries sharing the Pampa to accelerate conservation actions for this rich, diverse, highly threatened and fragile biome.

81. The Project was also consistent with the GEF 4 strategy, strengthening the policy and regulatory framework for mainstreaming biodiversity. The Project's objective remains also relevant to GEF 6 Programming Directions. Its objectives and results contribute to three GEF 6 focal area strategies:

- Biodiversity (specifically BD-1 Improve Sustainability of Protected Area Systems);
- Land Degradation (LD-3 Reduce pressure on natural resources by managing competing land uses in broader landscapes); and,
- Sustainable Forest Management (SFM-1 Maintained Forest Resources: Reduce the pressures on high conservation value forest by addressing the drivers of deforestation).

82. The Project supported the National and State government's efforts to develop and implement Brazil's National Environmental Policy[18] and the National Policy on Biodiversity as developed by the National Program of Biodiversity, under the Ministry of the Environment. The Project also supported efforts to strengthen state institutions and laws. The Project focused its interventions in four priority areas of the Pampa Biome, which supports

[18] http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=363

high levels of biodiversity and is considered one of the most globally significant areas for endemic birds, and is the second most devastated biome in Brazil. These priority areas were selected according to four main criteria: (i) areas of extreme importance for biodiversity conservation according to the Brazilian Ministry of the Environment; (ii) occurrence of threatened ecosystems or species; (iii) existence of opportunities with potential incremental activities; and (iv) the occurrence of protected areas.

83. The Project's objectives and results were also consistent with the national implementation of the Convention on Biological Diversity (CBD). In 2013 and based on the CBD's Aichi Targets, the government of Brazil established a new National Target for reducing the loss of Pampa native habitats by at least 50 percent by 2020 (in comparison with the 2009 rate). See: https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf.

84. In 2015, in its Fourth National Report to the Convention on Biological Diversity (CBD), Brazil reported on progress towards the 2010 CBD targets and outlined future priorities and challenges. In this report, Brazil emphasized that further strengthening the capacity to promote mainstreaming of biodiversity at the national level in key government and private sector planning strategies and practices and consolidating and strengthening institutions to produce biodiversity information were and continued to be critical challenges. Furthermore, the Brazil Fifth National Report to the Convention on Biological Diversity pointed out that (i) invasive alien species represent a higher threat to biodiversity in the Pampa biome than in other biomes and (ii) agriculture is by far the primary cause of habitat loss, which confirms the relevance of Project investments.

85. Agriculture development in the southern grasslands in the state of RS was historically based on conventional management practices that had a strong negative influence on soil carbon stocks. In contrast, in the already converted areas, there is potential to mitigate greenhouse gas emissions by using crop systems based on no soil tillage and cover-crops, generating effects mainly related to the potential of these crop systems to accumulate organic carbon in the soil at rates that surpass the increased soil nitrous oxide emissions. The research on carbon and greenhouse gases emissions in the southern Brazilian Pampa Biome is recent and the results are still fragmented. Nevertheless, the available data show that the natural grassland ecosystems under adequate management contain important stocks of organic carbon in the soil, and therefore their conservation is relevant for the mitigation of climate change.[19]

86. Finally, the Project also contributed to the objectives detailed in the World Bank Group's Country Partnership Strategy, approved by the Executive Directors on May 1, 2008 (CPS 2008-2011) (Report N. 42677-BR). The CPS called for reducing social and environmental problems in the least developed areas of the country and for promoting a more competitive Brazil by (i) promoting the more efficient use of human and natural resources and (ii) addressing the critical development nexus between agriculture and sustainable natural resources management. The Project remained highly relevant to the Country Partnership Strategy (2012-2015). The Brazil CPS (2012-2015) results area 4.3 is to "Improve environmental management, biodiversity conservation and climate change mitigation".

[19] Pillar VD, Tornquist, CG and Bayer C. The Southern Brazilian Grasslan biome: soil carbon stocks, fluxes of greenhouse and some options for mitigation. 2012. Braz.J.Biol, vol.72, no3 (suppl), p 673-681.

Relevance of Project Design

87. The relevance of the Project Design is rated **High.** Aiming at reducing threats to unique and globally important species and sites, the Project design relied on a set of preliminary research and analytical works as well as on a participatory planning process. Thus, Project Design relied on baseline data and information on existing policies, programs and institutions that affected the Pampa Biome, socioeconomic profiles of potential beneficiaries, socioeconomic and environmental assessments of pilot sites, a thorough analysis of the requirements to develop a Grassland Conservation Strategy, and eight rounds of consultations with the participation of a wide range of stakeholders residing in the Project area.

88. The underlying assumption behind Project Design was the assessment that sustainable land use in the grasslands is only possible if the economic activities are appropriately informed by the soil capacities and the adaptations of its plant and animal communities (Roesch *et all*, 2009). Consideration of the areas suitable for grazing, crop plantations, forest establishment, can help conserve areas for economic and ecological alternatives such as ecotourism. The use of native tree species in areas indicated for forest plantation may be an important source of conservation through on farm strategies. In addition, many native tree species are very important due to their medicinal and economical uses.

89. Planning conservation strategies for fauna and flora in the Pampa Biome shall take these facts into consideration. Thus, Project design considered: (i) the importance of the natural resource base for economic development and identified investment opportunities in the agricultural and non-agricultural sectors; and, (ii) the different groups of stakeholders to be engaged for the achievement of the Project's higher objectives.

90. Taking these assumptions into account, Project design relied on a mix of interventions and approaches for biodiversity conservation, adopting a strategy that properly relied on:

- The engagement of private landowners in rural areas for the adoption of biodiversity-friendly conservation practices and production systems;[20]
- Changes in the state's regulatory framework related with biodiversity conservation strengthening the capacity of biodiversity authorities to promote conservation, to create an enabling environment for biodiversity mainstreaming into State management that affected the sustainable management of the ecosystems;
- Research and communication strategies to cover knowledge gaps, disseminate information, increase environmental awareness, share lessons and promote sounding biodiversity conservation actions; and,
- The institutional strengthening of critical state agencies to increase their capacity to manage properly, efficaciously and sustainably a set of priority areas set aside for biodiversity conservation.

91. Given the extension of the grassland biome, the Project approach was to operate within selected priority areas relevant for biodiversity. The selection of the priority areas followed four criteria: (i) areas of high importance for biodiversity conservation according to

[20] This first approach relied on the institutional capacity and capillarity of the State agency (EMATER/RS) responsible for providing technical assistance and agricultural extension in the grasslands.

the Brazilian Ministry of the Environment; (ii) occurrence of threatened ecosystems or species; (iii) existence of opportunities with potential incremental activities; and (iv) the occurrence of legally protected areas. The selected priority areas are located both outside and inside fully protected areas. Outside of the protected areas, the Project worked with GEF-funding; inside them, the Project worked with counterpart funding**.**

Relevance of Implementation

92. Project's implementation ensured the continued relevance of its design. The Project developed action plans and a strategy regarding threatened species, sites and invasive alien species, increasing the framework of biodiversity conservation management tools available at the state level. The Project area covered 55 polygons (44 percent of 124 priority areas/polygons appointed by the Brazilian Ministry of the Environment in the state of Rio Grande do Sul (RS), of which 29 (53 percent) are of extremely high importance, 14 (25 percent of very high importance, and 11 (20 percent) of high importance. From those 55 areas, 53 are located in the Pampa Biome.[21] The Project actions are in line with legal provisions, especially the national implementation of the Convention on Biological Diversity (CBD), which was ratified by Brazil in 1994.

93. All of these outputs benefit state and municipal governments and civil society organizations, providing enhanced information and capacity for decision making in the long term. The Project was effective in coordinating with similar biodiversity projects in Argentina, Uruguay and Paraguay.

94. Considering all of these aspects of Project design and implementation, the ICR rates the overall relevance of the Project as **High**.

3.2 Achievement of Global Environmental Objectives

95. The Project objective is: "To promote the conservation and restoration of biodiversity in the state's grassland ecosystem in the Rio Grande do Sul's territory by mainstreaming biodiversity conservation within the forestry, agriculture and livestock productive landscapes."

Achievements by PDO/GEO parts

Part 1: Promote Conservation

96. The achievement of this part of the PDO/GEO was rated **Substantial**. The current literature points out that the creation and consolidation of protected areas (PAs) is one of the most effective tools to promote biodiversity conservation. The protected areas are also relevant due to their potential for ecotourism, environmental education and awareness raising, and scientific research. In addition, maintaining and restoring connectivity through the implementation of ecological corridors results in greater species richness (the potential for more individuals within a species) by providing more home range options that contribute to the conservation of small populations that are constrained by human activities. Increased connectivity can also facilitate dispersal; increase overall species' persistence, increase

[21] Patrocínio, D.N.M. et all. 2012. Projeto RS Biodiversidade como fator de contribuição à conservação da biodiversidade no estado do Reio Grande do Sul, Brasil. FEPAM em Revista, Porto Alegre, v. 6, n. 1, jan./jun. 2012.

genetic interchange among plant and animal species' populations, increasing levels of genetic variability within populations, all of which lead to increased species resilience to environmental changes.

97. Eleven rather than ten Protected Areas received support from the Project and they count for 32.4 percent of all protected areas in the State of Rio Grande do Sul. These supported PAs comprised an area equal to 223,432 ha. This total area under better protection and management equals three times the originally envisaged Project target and 30.6 percent of the area under protection in the Rio Grande do Sul state. The Project also enhanced environmental protection in an additional area equal to 233,635.39 hectares through the creation and implementation of the Quarta Colônia Ecological Corridor.

98. Table 2 below summarizes the Project's main outputs and achievements related to promoting conservation.

Table 2: Project main outputs and achievements related with Promote Conservation.

Topic	Context at appraisal (2009)	Project outputs (2016)	Project Achievement
Pampa Biome	17.7 million ha	Total area supported: 887,815.23 ha: - 233,432 ha brought under enhanced biodiversity protection/existing protect areas; - 233,635.39 ha brought under improved biodiversity protection/landscape management with increased ecosystems connectivity; - 415,691 ha with environmental assessment carried out - 5,056.33 ha of private landholdings adopting productive sustainable practices.	5% of the Biome area with some kind of intervention; 2.5% of Biome with direct intervention (PAs; sustainable practices)
Protected Areas	2.6% of the RS's territory (704,638ha) protected; 73 PAs	11 protected areas supported: 233,432 ha; one area placed under enhanced environmental conservation management: Quarta Colônia Ecological Corridor with 233,635.39 ha	32.4% of all protected areas in the RS supported; 30.6% of the State's area covered by protected areas supported; Increase in habitat connectivity and area under enhanced environmental conservation management
Threatened sites/ risk prevention plans	Occurrence of threatened sites and species	4 Rapid Ecological Assessments of areas of high importance for biodiversity conservation: (i) Varzea do Ibicuí area; (ii) Lagoa do Paurá area; (iii) Pedra do Segredo area; and (iv) Várzea do Quaraí area	Contributing to the definition of appropriate management practices to maintain or enhance biodiversity in these critical sites

Part 2: Promote Restoration

99. The achievement of this part of the PDO/GEO was rated **High**. The Project supported both the sustainable management of productive landscape, as well as the development of regulatory framework related to the control of invasive species. Contributing to the conservation and restauration of biodiversity, seven productive practices were mainstreamed into private landholdings: (i) management of grasslands; (ii) agroforestry system management; (iii) livestock forest management; (iv) native bee management; (v) organic fruits production; (vi) medicinal plants; and (vii) organic grains and vegetables production.

100. The number of rural properties adopting biodiversity conservation practices and sustainable production systems exceeded the target. In addition, a large number of rural producers attended training sessions and events and showed interest in adopting the sustainable production practices disseminated by the Project.

101. On a pilot basis, 610 landholders have implemented on-farm subprojects (577), demonstration units (31) and validation units (2), which fostered the adoption of sustainable land management practices with the support of EMATER/RS. With this outcome, the original target of this component was not only achieved, but surpassed by 22 percent. The total area implementing supported practices was 5,056.33 ha.

102. The potential positive results and impacts are even greater. In the selected priority areas, the Project promoted 174 training events on sustainable land management practices, with the participation of up to 8,571 rural producers. This level of participation means that up to 29 percent of local producers in the selected areas were involved in the training activities on sustainable practices promoted by the Project. In addition, 43 technical staff under EMATER – the agency in charge of providing technical assistance and rural extension, providing training to rural producers and fostering technological innovations for rural production in the state of Rio Grande do Sul – have been trained and qualified in production practices that favor biodiversity. Furthermore, publications on best practices related to sustainable production practices have been developed, printed and freely distributed to a large number of rural producers.

103. Anecdotal evidence from one case study related to the implementation of sustainable management of grasslands – the practice that was most broadly supported by the Project, reaching about 94 percent of the supported area under sustainable management – showed that, when adopting this system, producers reached relevant productivity and economic outcomes. Based on the current average price of live-weight steers in the state of Rio Grande do Sul (equal to Brazilian real 5.33/Kg),[22] this biodiversity conservation practice and production system has yielded incremental financial returns in the order of US$ 12,000 in the first year under the new grazing system (for a project investment lower than US$ 5,000).

104. According to the scientific literature, by promoting the adequacy of pasture stocking to grass availability and avoiding overgrazing, sustainable grazing practices contribute to increase and protect species diversity as well as to prevent and control the spread of invasive species.[23] These practices also contribute to reduce soil erosion and desertification, and to restore degraded pasturelands and natural grassland landscapes. There is also evidence that the sustainable management with the stocking of animals according to the supply of fodder has a positive impact on carbon sequestration. Finally, by fostering these practices, the Project has modestly contributed to the Brazil Nationally Determined Contribution (NDC) towards achieving the objective of the United Nations Framework Convention on Climate Change, which includes restoring an additional 15 million hectares of degraded pasturelands by 2030 and enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030.

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[22] Source: EMATER-RS, http://www.emater.tche.br/site/arquivos_pdf/precos/preco_27052016.pdf

[23] More than 800 species of grasses are among the 3,000 plant species found in the Pampa grassland biome and a significant number of them are listed among the species threatened with extinction. The main threats come from the conversion of natural grasslands into forest monocultures and/or intensive grain farming and from overgrazing.

105. The Project has also made a substantial contribution to promoting biodiversity restoration by developing and implementing seven restoration and conservation plans, including one for the restoration and conservation of Butiá palm fields,[24] and four action plans for controlling invasive alien species, which enhanced knowledge and proposed strategies to reduce biodiversity losses. The Project supported studies focused on: (i) the dynamics of butiazal regeneration: (ii) the mapping of remaining natural areas; (iii) fauna and flora associated with Butiá Palm fields; (iv) ecosystem regeneration and environmental services; and (v) socio-economic uses of the Butiá Palm. These studies showed that sustainable management can promote the development of new plantlets of Butiá, the improvement of native grassland biomass and support livestock production. The results of these studies and activities are contributing to the definition of appropriate management practices to maintain or enhance biodiversity of this critically important ecosystem. These studies are also helping to assess and monitor the status of biodiversity within the butiazal ecosystems. Additionally, educational and awareness activities were promoted focusing on sustainable economic uses, the biological importance of this ecosystem and the recognition of the environmental services it provides. The project had also positive impacts related to advocacy and economic development. On the one hand, a proposal is under discussion for ruling the exploitation of the *Butia odorata*; on the other, the Ministry of the Environment and EMBRAPA (in partnership with other agencies from Brazil, Argentina and Uruguay) created the "Eco-Touristic Route of Butiazais".[25]

106. Table 3 below summarizes the Project's main outputs and achievements related to promoting restoration.

Table 3. Main Project outputs and achievements related to Promoting Restoration.

Topic	Context at appraisal (2009)	Project outputs (2016)	Project Achievement
Rural producers in selected area	30,000 rural proprieties within selected priority areas	610 proprieties directly beneficiated; 8,571 rural producers participated in 174 training events on sustainable production practices, in 33 municipalities; 8 sustainable production practices demonstrated	2% of rural proprieties in the selected areas beneficiated, adopting sustainable practices promoted by the project; 29% of local producers involved in training activities on sustainable practices promoted by the project.

[24] The Butiá is a palm tree that encompasses around 20 species. They occur only in South America. The *Butia odorata* is native of the Pampa Biome and only occurs in Rio Grande do Sul and Uruguay. The butiazais ecosystems have great value for the ecological landscape, biodiversity and regional culture, providing habitat to a valuable diversity of native flora and fauna and hosting a diversity of herbaceous species, especially grasses and legumes that have great value as fodders. The fruits of the Butia are used in the production of jellies, jams and liqueurs, representing an extra income for many families engaged in extractive activities, crafts and small processing activities.

[25] On the Eco-Touristic Route of Butiazais: http://www.mma.gov.br/index.php/comunicacao/agencia-informma?view=blog&id=1295; https://www.embrapa.br/web/portal/busca-de-noticias/-/noticia/2561033/pesquisa-propoe-rota-internacional-dos-butiazais; https://www.embrapa.br/busca-de-noticias/-/noticia/7621812/rota-dos-butiazais-e-oficializada-em-tapesrs; https://www.embrapa.br/busca-de-eventos/-/evento/212653/ii-seminario-tecnico-da-rota-dos-butiazais-dos-colchao-de-crina-a-rota-dos-butiazais

Topic	Context at appraisal (2009)	Project outputs (2016)	Project Achievement
Biodiversity restoration/ conservation plans	Loss of biodiversity	7 restoration and conservation plans were implemented: (i) Butiá Palm; (ii) Ornamental Plants; (iii) Annoni Grass; (iv) Pampa Grassland; (v) Litoral Médio – Lagoa do Peixe Region; (vi) Espinilho Park; and (vii) Native Bees	Guidance and plans defining command and control, and conservation practices
Invasive alien species	Loss of biodiversity	Four invasive species plans were developed: (i) wild boar; (ii) pine tree; (iii) *Axis* deer; and (iv) Quarta Colônia action plan.	Invasive alien species control plans established and under implementation

Part 3: Mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes.

107. The achievement of this part of the PDO/GEO was rated **High**. The regulatory framework related to biodiversity conservation has been strengthened. Thirteen regulatory instruments have been designed and entered into force. These instruments set procedures and rules for dealing with the identification and control of invasive alien species, the protection of special sites and endangered species, the monitoring of biodiversity in the grasslands, and for setting incentives for promoting biodiversity conservation opportunities, and delineate an ecological corridor, which encompasses three times the originally envisaged area.

108. The Project has also provided support to the production of knowledge on biodiversity conservation in areas of high importance for biodiversity conservation and on threatened species of the Pampa and Atlantic Forest biomes. Knowledge Generation included publication and dissemination of relevant studies, papers and other publications, as well as the development and implementation of (i) risk prevention plans, (ii) biodiversity restoration and conservation plans, and (iii) invasive alien species control plans. Four areas were prioritized for control and management of invasive alien species, namely:

- The buffer zone of the Quarta Colônia State Park, where the control of *Hovenia dulcis* and *Acacia mearnsii* was prioritized;
- The Litoral Médio region focusing in the control of the *Pinus spp*;
- The buffer zone of the Espinilho State Park focusing on early detection and rapid response to sightings of the Axis-Axis deer; and
- The Grande Island in the Casamento lagoon focusing on the control of the population growth of boars (*Sus scrofa*).

109. The ICR concludes that databases, monitoring systems, studies and knowledge generated by the Project have proven very useful, and have, indeed, been fully incorporated in the design and implementation of critical tools for environmental management and policy planning by the State of Rio Grande do Sul.

110. Table 4 below summarizes the Project's main outputs and achievements related to mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes.

Table 4. Project main outputs and achievements related with mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes.

Topic	Context at appraisal (2009)	Project outputs (2016)	Project Achievement
Education and Awareness Raising of the Population in project area	Project area had 157,887 inhabitants, including rural and urban population	2,357 participants in educational events; 4,660 students and teachers attended exhibition of theater plays reaching 16 schools; 332 teachers from 134 public state schools were enrolled on environmental education workshops and seminars, acting as multipliers amongst 8,800 high school students; 8,571 rural producers who participated in training events; 19,292 accesses to Project's YouTube videos, Facebook and Twitter; 66 educational television programs and 22 radio programs broadcast by 11 regional and statewide television and statewide radio networks. *Total of 25,557 participants in face-to-face events.*	16.5% of project area inhabitants participated in face-to-face educational events and trainings. Increased awareness among local stakeholders about the environmental and economic value of biodiversity
Legal framework	Deficient regulatory framework to promote sustainable practices integrated with biodiversity conservation	13 regulations established: (i) the native bees' state regulation; (ii) eight state regulations focusing on alien invasive species; (iii) the state decree on Grassland Conservation Index (*Índice de Conservação dos Campos Nativos - ICP- Indice de Conservación del Pastizal*) – ; (iv) the state decree on alien invasive species list; (v) the state decree on the state monitoring system; and (vi) the state decree on the creation of the Quarta Colônia Ecological Corridor	Rules that govern and regulate decision making, command and control actions, and productive practices with focus on biodiversity conservation and restoration improved and under implementation
Knowledge	Knowledge gaps on sound biodiversity conservation actions	Fifteen publications (57,000 printed copies) and two DVDs (3,000 copies); 25 contributions/papers and summaries presented at National and International technical and scientific meetings; SIGBIO and RSBIOMONITORA systems	Knowledge generation on biodiversity, which has provided critical information for the database on biodiversity, vegetation cover and other socio-economic factors driving the current trends in the Pampa
Institutional capacity building	Deficient institutional capacity to promote sustainable practices integrated with biodiversity conservation	837 staff members of SEMA, FZB and FEPAM attended training seminars, workshops or courses 434 technical staff from EMATER/RS and municipal secretariats of agriculture and environment) working at 43 municipalities were trained in topics related to biodiversity conservation and sustainable management of natural resources International Seminar on the Pampa Biome: Biological, Cultural and Economic Values, 400 participants *Total of 1,671 participations in face-to-face training activities*	Four state institutions in charge of biodiversity conservation strengthened, through the provision of equipment and training on sustainable practices, command and control, and policy implementation

111. The Project successfully assisted the Rio Grande do Sul government to make an impact in four critical dimensions:

(i) mainstreaming biodiversity at the on-farm level in the Pampa Biome;
(ii) strengthening public policy and regulatory framework;
(iii) improving institutional capacity to produce and disseminate biodiversity information and knowledge; and,
(iv) consolidating the network of protected areas within the Pampa Biome.

112. Due to the Project's pilot nature, the number of landholdings receiving direct support of the Project to implement sustainable productive practices that contribute to biodiversity conservation was small in relation to the number of rural landholdings (assistance was provided to 2.5 percent of the total number of landholdings). However, the potential positive results and impacts of the Project are larger and reach a meaningful parcel of the target population. As a testimony of these larger impacts and the potential for scaling-up the dissemination of biodiversity-friendly production practices among rural producers, the ICR highlights three Project outcomes. First, the large participation of rural producers on knowledge exchange opportunities to learn about sustainable production practices and natural resources management (participants in training events account for 29.0 percent of the rural producers living in the priority areas). Second, the process of institutional strengthening of the agency in charge of providing technical assistance to rural producers - technical staff acting in all 33 municipalities of the priority areas have received training in sustainable productive practices that contribute to biodiversity conservation. Finally, the large amount of educational, knowledge sharing and awareness raising materials (including operational guidelines about best production practices) that has been printed and freely distributed to rural producers by the Project. Annex 2 describes in detail the achievement of the indicators by each component of the Project.

113. Therefore, the ICR concludes that the overall achievement of the Project PDO/GEO is **Substantial.**

3.3 Efficiency

114. Consistent with the Project approval regime, efficiency is assessed based on the cost-effectiveness of the proposed Project design and strategy, and is rated **Substantial**.

115. At the preparation stage, there was agreement that estimating in monetary terms the real value of biodiversity conservation and conservation policies was difficult. Furthermore, determining in advance an estimated economic rate of return for the Project as a whole would be not possible. There was agreement that an assessment of cost-effectiveness of the proposed Project design and strategy – focused on changes in policies with direct impact on biodiversity and on building of human capacities in sectors that have a direct impact on biodiversity as a means of creating positive trends in conservation with minimal costs – would be the most appropriate approach.

116. Thus, the Project closed with complete physical and financial execution. The ratio between operational costs and substantive expenditures was similar to the one originally approved by the donor and the lifespan of the Project only had to be extended 20 percent, compared to that originally planned. Despite initial challenges, the State government and implementing agencies were able to deliver the agreed activities and outcomes of the Project. By and large, the design and delivery mechanism have proven to be appropriate to achieve the Project's results.

117. Following GEF guidance, a full Incremental Cost Analysis was also carried out to assess the incremental benefit provided by the GEF grant. This analysis showed that under the "business as usual scenario" the State would implement only limited and uncoordinated interventions to mitigate environmental impacts of economic activities. The analysis also estimated that the incremental costs for achieving significant domestic and global environmental benefits equaled US$ 5 million.

118. Domestic and global benefits include the reduction of deforestation and destruction of ecosystems; decreased loss of globally significant biodiversity and protection of endangered species; production and dissemination of information on biodiversity; increase in biodiversity-friendly economic practices and private sector interest in and capacity for biodiversity conservation; control and management of invasive alien species, etc.

119. The activities promoting biodiversity conservation in areas selected according to their priority for biodiversity conservation included: (i) the improvement of the managerial capacity of eleven Protected Areas, which together comprise 223,432 ha; (ii) the elaboration and implementation of four biodiversity conservation strategies for four priority areas (namely: Várzea do Ibicuí, Pedra do Segredo, Lagoa do Paurá and Várzea do Quaraí), which totalize 415,691 ha; and (iii) the establishment of the Quarta Colônia Ecological Corridor, which comprises 483,744 ha. In total, activities promoting biodiversity conservation reached 1,122,866 ha. Considering that the Project has invested US$ 9,076,212 in subcomponents 2.1 and 2.2, the average investment per hectare for promoting biodiversity conservation can be roughly estimated at US$ 8.08 per hectare.[26] Data available in Brazil shows that the average cost of the creation and management of Protected Areas varies widely among biomes. The average value ranges from US$ 3.83 per hectare, in the Amazon Rain Forest, up to US$ 93.25 in the most valued areas of the Atlantic Forest biome.[27] These parameters suggest the comparative cost-effectiveness of the investments made by the Project in promoting biodiversity conservation in areas where land prices are also high.

120. In addition, utilizing an extensive model measuring the Internal Rate of Return (IRR), an assessment of demonstration projects to be supported under Component 1 was developed during preparation. This assessment indicated that the proposed conservation practices that should be mainstreamed in the main productive systems of the grasslands would yield benefits from the viewpoint of the sustainability of natural resources and biodiversity in the Project area as well as incremental financial returns to participating farmers. The return on farmers' investments would be larger than the opportunity costs of capital. Considering a sample of seven demonstration units, the IRR should range from a low 4.13 percent up to 59.6 percent.

121. EMATER-RS reported preliminary results of assessments related to the adoption of sustainable management of grasslands – the sustainable production practice that was most broadly disseminated (this practice was adopted and implemented in 94 percent of the area of private landholdings in which the Project made interventions). This preliminary assessment shows that this practice has yielded benefits related to both the sustainability of natural resources and biodiversity in the Project area and significant incremental financial returns to participating farmers.

122. Thus, one of the Project's demonstration units of grazing systems using native pastures was a family farm located in the municipality of Caçapava do Sul. This farm held a grazing management area equal to 27 hectares of native pasture. The grazing plan split the area in 22 paddocks and kept a cattle stocking density equal to 3.2 animals per hectare. After

[26] When the amount of investments under subcomponent 2.1 (US$ 4,877,407) and the size of the land in protected areas (223,432 ha) are used as parameters for analysis, the average investment value can be roughly estimated at US$ 21.83/ha. It remains, therefore, a highly cost-effective investment.
[27] Lemos de Sá, R (coord), 2014. Funbio + Áreas Protegidas. Rio de Janeiro: Funbio. Available at: http://www.funbio.org.br/wp-content/uploads/2014/11/Livro_Funbio_Areas_Protegidas_Web_Port.pdf.

the adoption of the new grazing system, the carrying capacity of its paddocks increased 46 percent and achieved live weight gains equal to 298.6 kg/ha as well as average daily gains of live weight of steers equal to 0.536 Kg/day. Based on the current average price of live-weight steers in the state of Rio Grande do Sul (equal to Brazilian reais 5.33/Kg),[28] this biodiversity conservation practice and production system has yielded incremental financial returns in the order of US$ 12,000 in the first year under the new grazing system (for a project investment lower than US$ 5,000).

123. Based also on previous experimental research on grazing and ranching systems in the Pampa biome carried out by the Rio Grande do Sul Rural Federal University, these gains are not overestimated. This research shows that live weight gains equal to 298.6 kg/ha/year (as recorded) means four times more than what can be achieved with traditional extensive systems in the Pampa (which yield live weight gains of just 70 Kg/ha/year). The findings of this research showed that live weight gains would triplicate with adequacy of stocking to pasture availability and would reach 400 kg/ha/year when adding the introduction of fertilizers to the adequate number of cattle heads per grazing area.[29]

124. When rating the Project's efficiency, the ICR takes into consideration: (i) its piloting nature; (ii) the demonstration objective of the on-farm sustainable production practices supported; (iii) the large interest of landholders in these practices and the potential of scaling-up their use (as proven by the large number of participants in training events); (iv) the anecdotal and experimental evidences reported; and (v) its comparative cost-effectiveness with regards to the expansion of the areas under improved biodiversity conservation management. In consequence, the ICR rates the Project's efficiency as **Substantial**.

3.4 Justification of Overall Outcome Rating

125. The overall outcome rating is based on the following ratings for relevance, efficacy and efficiency:

126. **Relevance: High**. The PDO and project design reflected a well-diagnosed set of priorities aligned to past and current Bank, GEF and Rio Grande do Sul government strategies.

127. **Efficacy: Substantial**. Two objectives were rated 'High' and two '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.

128. **Efficiency: Substantial**. The Project closed with a full level of physical and financial execution. The ratio between operational costs and substantive expenditures was similar to the one originally approved by the donor and the lifespan of the Project only had to be extended 20 percent, compared to that originally planned. By and large, the design and delivery mechanism have proven to be appropriate to achieve the Project's results.

129. Consequently, the ICR rates the overall outcome as **Satisfactory**.

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[28] Source: EMATER-RS, http://www.emater.tche.br/site/arquivos_pdf/precos/preco_27052016.pdf

[29] Nabinger et al. 2009, "Produção animal com base no campo nativo: aplicações de resultados de pesquisa". In Pillar, V. et al. *Campos Sulinos – conservação e uso sustentável da biodiversidade*. Brasília: MMA.

3.5 Overarching Themes, Other Outcomes and Impacts

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

130. The Project had direct positive impacts on livelihood diversification and income generation in rural areas.

131. In the priority areas of intervention – as elsewhere in Brazil – family farmers prevailed among the landholders. They accounted for 86 percent of the rural landholdings, mostly small (an average individual area of 17.2 hectares), and correspond to 30.5 percent of the state's agricultural area. Women are a minority among the family landholders (only 9.6 percent – far below the national rate of 13.7 percent). On average, each family farm employed 2.4 persons.

132. Primary beneficiaries of the Project's Component 1 (On-Farm Biodiversity Mainstreaming) were farmers, with a strong emphasis on small and medium-sized producers (family farms). In this context, the Project focused its implementation on environmentally sustainable production practices that incorporated innovation and led to income generation and food security by promoting livelihood diversification.

(b) Institutional Change/Strengthening

133. As part of Components 1 and 2, the Project focused on strengthening four governmental institutions: SEMA, EMATER/RS, FZB and FEPAM.

134. The Project focused on providing training for technical staff as well as equipment and durable goods for the four implementing agencies that are also the institutions in charge of environmental and biodiversity management in the state – SEMA, FEPAM and FBZ. The Project supported EMATER/RS institutional strengthening, and promoted training events focused on natural resources management and low-impact agriculture for its rural technical assistants acting in the 33 target municipalities, and in additional 10 municipalities. Thus, the Project has also surpassed its original target of having 24 municipalities within the priority areas with at least one rural technical assistant trained in natural resources management.

135. The Project has also placed a strong focus on influencing policy and practice guidelines, which affect a broad number of stakeholders while costing relatively little. The Project has substantially contributed to the production of knowledge about the Pampa Biome, which contributes to building institutional capacity and guide policy decision-making. The production and publication of studies, rapid ecological assessments, control plans for invasive alien species, and site/species protection action plans have also made a strong contribution to institutional strengthening and for the proposal and official publication of relevant regulatory frameworks concerning biodiversity conservation.

136. Through support to the establishment of a strong regulatory framework, the Project helped to put in place relevant policies, rules and institutional competencies to deliver better quality governmental services related to biodiversity in the state of Rio Grande do Sul. The establishment of a public policies framework focusing on biodiversity conservation is a critical step in the right direction.

137. Overall and considering the provision of incentives, equipment, infrastructure and training, regulatory framework, and also the implementation of policy-dialogue activities, the ICR considers that Project's outcomes on institutional development and strengthening the

regulatory framework for biodiversity conservation has exceeded the expectations. The ICR also finds that the Project has substantially contributed to strengthen the capacity of SEMA, FZB, and FEPAM to: (i) develop more effective strategies for biodiversity conservation; (ii) promote the sustainable use of natural resources; (iii) enforce public policies; (iv) provide quality services for the landholders; and (v) monitor biodiversity conservation in the State. In consequence, the ICR concludes that Project's impact on institutional development was substantial.

4. Assessment of Risk to Development Outcome

Rating: Moderate

138. In terms of On-Farm Biodiversity Mainstreaming, the sustainability of the outcomes are guaranteed through capacity building activities for stakeholders and the extension activities of EMATER-RS – the state agency responsible for technical assistance and agriculture extension in the priority areas. In order to promote ownership and maximize the wider application of sustainable practices and landscape management, the Project's approach has built on EMATER-RS's extensive on-the-ground experience and relied on highly participatory processes. The results achieved in the field are very likely to be sustained in the midterm, as the related production systems have proven beneficial for the landholders that applied them.

139. In terms of Biodiversity Management, the Project succeeded in putting in place a strong set of regulations as well as mechanisms for working collaboratively and multi-institutionally that will be difficult to reverse. Considering public policies and regulatory framework, the Project established an important set of legislation that ensures the control of invasive species and establishment of the Quarta Colônia ecological corridor. These policy changes contribute to the overall sustainability of Project outcomes. The knowledge products generated by the Project are highly likely to be sustained in the longer term after the completion of the Project, as they have been widely disseminated and adopted, in different ways, by a wide range of stakeholders.

140. Although the results of the Project are consistent, overall long-term conservation depends on both socio-economic and ecological aspects, and therefore, important risks to the sustainability of the Project's development outcomes are found in the current country (Federal and State) economic and financial crises. Biodiversity conservation incentives may lose priority among governmental policies in the coming years.

141. As factors that can mitigate these risks related to the macroeconomic and political environment, the ICR highlights that the Project has supported studies and activities that have improved the regulatory and monitoring framework for biodiversity conservation, increased public awareness on the value of biodiversity conservation and the risks of biodiversity loss, strengthened the institutional capacity of state agencies in charge of biodiversity conservation and licensing processes, and mainstreamed sustainable production systems in the technical assistance and rural extension state agency as well as among organizations of rural producers. The large interest expressed by rural producers on these more sustainable production practices – as evidenced by the large number of producers participating in training events offered by the Project – demonstrate that the Project has raised biodiversity conservation awareness among these critical stakeholders for the conservation of the grasslands. Stronger regulatory framework, enhanced public awareness raised among citizens and civil society organizations, expanded sentiment of ownership of the measures taken among the rural

producers, are all expected to contribute to minimize risks to the sustainability of the process of mainstreaming biodiversity in the Pampa biome championed by the Project.

5. Assessment of Bank and Borrower Performance

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Satisfactory

142. Preparation was characterized by a long process (2004-2009). The Project was originally conceived as a US$ 17 million operation, and as a complement to the Rio Grande do Sul Integrated Regional Development Investment Financing Loan. During Project preparation, the total amount to be supported by the GEF was reduced and the World Bank loan was dropped. These decisions increased the Project's implementation challenges because the originally planned activities and strategies were maintained, however the project was able to overcome this

143. The Project design reflected lessons learned from other operations including the importance of recognizing the expertise and views of local people and creating a sense of shared ownership of resources and obligations.

144. The Project design adopted a multi-pillar strategy and a complex institutional arrangement, including five implementing agencies. It was complex, but necessary to move towards stronger and deeper alliances that require the involvement of all actors, and to address historical drivers of biodiversity loss in the grasslands.

145. Some of the Project outcome indicators overlapped with intermediate outcome indicators. As it was usual at the time of project preparation, the PDO/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. Furthermore, M&E design, capacity building, communication, and education and awareness were critical indicators of the Project, but it was not established how to measure their effectiveness. This means that there are no indicators nor benchmarks to monitor the progress of individuals and organizations as they acquire or enhance capacities and awareness.

146. The Project's risk assessment was successful in identifying the most relevant risk factors the operation faced and in proposing effective mitigation measures.

147. The Project Task Team Leader (TTL) changed during the last phase of the preparation process, but a close and productive relationship was established with implementing agencies. Overall, the implementing agencies expressed the opinion that the design helped to build a strong institutional partnership and team ownership.

(b) Quality of Supervision

Rating: Satisfactory

148. Implementation support missions were conducted routinely, and managed by staff in the Brazil Country Office. IBRD conducted 10 supervision missions and several technical meetings over the life of Project. In addition to the biannual supervision missions, the IBRD

team maintained close communication with the PIU, including technical meetings, phone conferences and prompt support as needed.

149. In order to optimize the use of supervision funds, several missions were held in combination with the Rio Grande do Sul SWAp Project, as the TTL was also part of the SWAP Project team. The Project's 12 ISRs addressed, in detail, the Project implementation history and path, providing a consistently satisfactory view of the implementation status of the Project's components.

150. The IBRD fulfilled its fiduciary supervisory duties, including regular supervision missions during the implementation stage, and provided extensive technical advice from Bank specialists on financial management and procurement issues, including regular expenditure and post procurement reviews.

151. In exercising their due diligence and keeping high integrity standards, IBRD and the client worked together and identified a potential fraud incident in FY2015. This event was flagged by the PIU and further reviewed by the IBRD's Procurement Specialist. The issue led to an Institutional Integrity Vice-presidency (INT) investigation that resulted the substantiation of allegations, and the task team offered its assistance as needed.

152. The focus on integrity and good project supervision demonstrated that the fiduciary partnership between IBRD staff and clients, including, but not limited to the training provided by IBRD's Procurement and FM specialists, and implementation course adjustments based on post review findings, all contributed to better resource management, and thus enhanced the Project's overall technical results.

153. The IBRD team also ensured that compliance with environmental and social safeguard issues was also effectively addressed.

154. External assessments financed under the Project provided inputs to the Mid-Term Review (MTR).

155. The achievement of the Project GEOs, the improvements made on the overall implementation progress, the efficiency in effectively coordinating actions of the implementing agencies were all informed by targeted, thorough, and consistent implementation support provided by the Bank team.

(c) Justification of Rating for Overall Bank Performance

156. Given the moderately satisfactory quality of Bank performance at entry and the satisfactory quality of Bank supervision and implementation support during Project implementation, the Bank's overall performance is rated **Moderately Satisfactory**.

5.2 Borrower

(a) Government Performance

Rating: Moderately Satisfactory

157. The Project faced a few challenges in its initial phase of implementation. Between 2011 and 2014, there were four different Secretaries in SEMA, associated with two state elections and institutional re-organizations.

158. In addition, in 2012, a fire destroyed part of the SEMA headquarters, leaving the Project without access to its documentation and without an office from which to operate for weeks; and the PIU faced a complex process to obtain the State legal authorization to hire consultants. Public servants' strikes also negatively influenced the Project pace of implementation. Due in great part to financial problems faced by the State government, fund availability was not adequately provided and procurement activities suffered substantial delays. For example, each process to hire and individual consultant took about six months.

159. Thus, there were areas in which the State government could have played a more effective role in supporting the Project. These included difficulties in completing effectiveness requirements in 2010 and difficulties in obtaining legal authorization and funds to proceed with procurement activities.

(b) Implementing agencies performance

Rating: Satisfactory

160. The Project had five implementing agencies: SEMA, FZB, FEPAM, EMATER/RS, and The Nature Conservancy (TNC). In general, the implementing agencies carried out their responsibilities properly providing required reporting, and addressing issues, as they arose, in a timely manner. SEMA, FZB, FEPAM, and EMATER/RS's teams embraced the Project not only in terms of institutional responsibility, but also as a personal and professional commitment to promote biodiversity conservation and sustainable development. The Project also provided the opportunity to integrate institutional efforts and work in a new perspective to mainstream biodiversity conservation into private areas.

161. *State Secretariat of Environment and Sustainable Development (SEMA).* The general coordination and management of the Project was housed at SEMA where the Project Implementation Unit (PIU) was located. Despite the challenges associated with the mentioned changes in the State government and the implementation of a Project with five institutional partners and a large scope, SEMA was committed to the Project approach and goals.

162. The overall PIU's performance was fully **Satisfactory**, which to a great extend can be attributed to the high level of commitment and capacity of the PIU team. The PIU ensured continued successful coordination among the four main institutions involved in the implementation of this Project. Despite of institutional changes and challenges, the PIU team played a key role in negotiating with other government institutions and teams to achieve the resolution of issues and overcome financial and political constrains.

163. The PIU team also did a very good job in monitoring and evaluating Project outputs and outcomes, and reporting progress to the Bank. They were directly responsible for all technical, fiduciary and legal aspects of the grant. The Project's indicators were systematically and regularly monitored, evaluated and reported. The PIU team also facilitated Bank supervision.

164. Stakeholders were involved since the beginning of Project preparation and kept engaged and informed throughout Project implementation. Facebook, twitter, website, and other electronic media were regularly and widely used for Project dissemination and stakeholders' engagement.

165. The PIU maintained detailed accounts, technical records, and continuously updated the indicators table throughout implementation of the Project. These updated records were periodically evaluated and submitted to the Bank. Lists of participants on Project supported activities and events, regulatory documents, photographic records, and other evidences were systematically documented. Nine technical reports and one completion report were submitted to the Bank, including evidences of outputs and quantitative and qualitative data.

166. *EMATER/ RS.* EMATER/RS was responsible for technical assistance and agricultural extension in the grasslands as well as to provide training for landholders and local technicians focusing on sustainable production practices. The Component 1 efforts were successfully built on EMATER/RS extensive experience and commitment to maximize the adoption of sustainable production practices. EMATER/RS was, and remains, a strong advocate for action in support of sustainable production practices and biodiversity conservation, proving to be a substantial partner. Moreover, EMATER/RS surpassed the commitment of expected counterpart funds and indicators' targets. Thus, EMATER/RS performance is considered fully **Satisfactory**.

167. *Fundação Zoobotânica (FZB).* As part of the Project, FZB developed field studies, events, information dissemination, environmental education, policy framework among other activities focusing on landscape management, sustainable use of biodiversity and biodiversity protection. Many experts were involved on field studies and preparation of books, papers, guidelines and others dissemination documents. All planned activities were delivered, despite of institutional changes and restriction in funds allocation. The FBZ team showed a strong commitment and ownership of the Project as well as a strong commitment to the sustainability of institutional partnerships and Project's outcomes. FBZ performance is also considered fully **Satisfactory**.

168. *Fundação Estadual de Proteção Ambiental (FEPAM).* As planned, FEPAM developed field studies, proposals of public policies, and territorial management strategies. The FEPAM team played a critical role for the design of the Quarta Colônia Ecological Corridor. In line with SEMA, EMATER/RS and FZB, FEPAM team was very committed to the Project objectives and to the sustainability of the partnership and outcomes. FBZ performance is also considered fully **Satisfactory**.

169. *The Nature Conservancy (TNC).* TNC participated in Project implementation supporting private landholders and the Municipal government of Rosario do Sul municipality to adopt integrated landscape management and promote the rural environmental cadaster. The lack of local staff and institutional presence in Rio Grande do Sul and the failure to participate in the Project's technical groups and meetings constrained the implementation of these activities. In addition, changes in the Municipal government, delays and lawsuits against the changes required in the legal framework for accomplishing environmental regularization in the Pampa biome, and difficulties to follow Bank's procurement procedures also obstructed TNC's performance. Consequently, the goals of the activities under TNC's management were only partially achieved and TNC's performance is considered **Moderately Satisfactory**.

(c) Justification of Rating for Overall Borrower performance

170. Following ICR guidelines, the overall Borrower performance is rated **Moderately Satisfactory**, while the Government performance is rated Moderately Satisfactory, and the Implementing Agencies performance is rated Satisfactory.

171. The Project outputs were completed in a highly satisfactory manner, due in large part to the commitment and leadership demonstrated by the PIU team and to the successful interinstitutional collaboration among SEMA, EMATER/RS, FEPAM and FZB.

172. SEMA, EMATER/RS, FEPAM and FZB teams embraced the Project not only in terms of institutional responsibility, but also as personal and professional commitments to promote biodiversity conservation and sustainable development in the Rio Grande do Sul State.

6. Lessons Learned

173. ***Project's goals should not only reflect the project duration and the time needed to enhance conservation and restoration of biodiversity, but also PDO/GEO should be specific, clear, measurable, attributable, and verifiable during the project lifetime.*** At the time of project preparation, PDOs and GEO used to be more ambitious than was reasonable to achieve during the project lifetime. These goals and impacts are difficult to measure in short timespans and monetary terms. Additional monitoring and evaluation challenges emerge when biodiversity conservation projects require the integration of a mix of policies and measures, combining the sparing of lands for conservation purposes with the sharing of lands with productive activities (as in the case of the proper strategy for the conservation of grasslands in the Pampa biome). Biodiversity projects have been routinely criticized for being based on short funding cycles that do not reflect the time required to reach the goals and to measure the results related to biodiversity conservation and restoration. Although the available scientific knowledge supports the conclusion that Project outcomes are likely to promote long-term biodiversity conservation and restoration in the selected priority areas, these gains – as well as the parameters for accurately assessing the effectiveness and efficiency of the actions taken to achieve them – will be measurable only in the long-term. To date, literature and the conservation community have not been very successful in defining clearly measurable goals to guide biodiversity conservation projects. Be this as it may, the most basic lesson drawn from the Project is that the starting point for any biodiversity conservation project must be to define specific, clear, measurable, attributable and verifiable (during the project lifetime) PDO/GEO. In most cases, however, because biodiversity conservation takes place in a multi dimension environment and projects should be innovative and ambitious, such definition is not surprisingly difficult.

174. ***Government procedures should support project activities and project management. State financial management and procedures were the most significant barriers to implement the Project planned activities.*** Although Bank financial and procurement procedures were mandatory to implement project activities, government procedures were complementary and required. Project performance was negatively affected by the State financial and political crises, the complex process to obtain governmental clearances for payments, and funds availability. The project started under the premise that grant funds should be easier to implement than loans or other reimbursable resources and least affected by externalities such as political and financial internal crises. These premises showed to be incorrect. The experience showed that it does not matter if it is a grant or a loan, the government financial and political management, availability of counterpart funds, and internal procedures are extremely important for determining project implementation performance.

175. ***When biodiversity conservation has to deal with the complex interaction of environmental and livelihood issues, there may be a need to have complex institutional and implementation arrangements***. Biodiversity conservation in the Pampa grasslands calls for a mix of policies and measures to address through multi-institutional actions the complex interaction between promoting sustainable agriculture and biodiversity conservation. The critical lesson from the satisfactory implementation of the Project is that complex institutional and implementation arrangements can work effectively when there is a strong vertical and horizontal coordination among the multiple agencies and stakeholders engaged in project implementation. The key elements to ensure efficiency and effectiveness in project management are: (i) definition of a clear vertical and horizontal institutional arrangement; (ii) the adoption of transparent management, decision-making and control processes; (iii) the establishment of a clear system of accountability through transparency and documentation; and (iv) the supply of relevant and timely financial resources.

176. ***When biodiversity conservation has to deal with the complex interaction of environmental and livelihood issues, there is a need to engage multiple stakeholders and to foster shared ownership of strategies and goals among them.*** By promoting a landscape approach that can be scaled up to cover a larger area, the Project has demonstrated the relevance of convening multiple stakeholders and fostering a convergence of understandings and objectives among the several stakeholders within the landscape. The Project's satisfactory implementation and future sustainability heavily rely on the highly participatory approach followed in its preparation and implementation, the engagement of local producers associations, civil society organizations and public authorities and the constitution of a multi-stakeholders' steering committee.

177. ***Monitoring and Evaluation systems of Projects involving a great deal of capacity building, awareness raising and advocacy interventions should include more effective methodologies for assessing changes in understanding, views and behavioral changes.*** The Project's monitoring and evaluation system did not include result indicators able to measure changes in understanding, views and behaviors as result of the large number of activities implemented to this end. The monitored indicators (number of participants or audience in training and communication events) are only output indicators. Although they have been thoroughly monitored and reported by the Borrower, they do not allow a better understanding of how the activities supported by the project may have influenced their beneficiaries and/or induced changes in their ordinary behaviors, understanding of biodiversity issues, and production practices. It is vital that future projects develop ways to measure the influence made by education, awareness, advocacy, and training activities on their target public.

7. Comments on Issues Raised by Borrower

Not applicable**.**

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: On-Farm Biodiversity Mainstreaming	1.85	1.72	93. %
Component 2: Biodiversity Management	2.50	2.81	112.%
Component 3: Project management	0.50	0.57	114%
Unallocated resources	0.15	--	
Total Baseline Cost	5.00	--	100%
Total Project Costs	**5.00**	**5.10**	**101%**
Project Preparation Facility (PPF)	0.350	0.349	
Total Financing Required	**5.350**	5.449	101%

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual (USD millions)	Percentage of Appraisal
Recipient		6.10	9.66	158%
Global Environment Facility (GEF)	Grant	5.00	5.09	102%
		11.10	**14.76**	**133%**

GEF actual amount included the interest rate.

(c) Project Cost by Financing, Component, and Subcomponent (in USD Million equivalent)

Component/ Subcomponent	GEF			Counterpart			Total		
	Estimated	**Actual**	**%**	**Estimated**	**Actual**	**%**	**Estimated**	**Actual**	**%**
1: On-Farm Biodiversity Mainstreaming	**1.85**	**1.72**	**93**	**0.50**	**1.07**	**209**	**2.35**	**2.79**	**118**
Demonstration units	0.24	0.16	68	0.28	0.53	190	0.52	0.69	132
Subprojects implementation	1.61	1.56	97	0.22	0.54	245	1.83	2,10	114
2: Biodiversity Management	**2.50**	**2.81**	**112**	**4.71**	**7.67**	**163**	**7.21**	**10.48**	**145**
Protecting species and sites	0.79	0.75	95	3.23	4.12	127	4.02	4.87	121
State's regulatory framework	1.06	1.50	141	1.12	2.71	242	2.18	4.19	192
Environmental awareness	0.65	0.56	86	0.36	0.84	230	1.01	1.40	138
3: Project management	**0.50**	**0.57**	**114**	**0.71**	**0.93**	**131**	**1.21**	**1.49**	**123**
Institutional structure	0.44	0.55	125	0.46	0.74	160	0.90	1.29	143
M& Evaluation system	0.06	0.02	30	0.25	0.19	77	0.31	0.20	65
Unallocated Resources	0.15	--	--	0.18	--	--	0.33	--	--
Total project implementation	**5.0**	**5.1**	**102**	**6.1**	**9.67**	**158**	**11.11**	**14.76**	**133**

Counterpart sources: Environment Compensation system; annual allocation for the agencies; FZB, SEMA, FEPAM; Annual allocation for EMATER/RS; Annual allocation for TNC.

Annex 2 – Outputs by Component

1. The Project Development Objective (PDO)/Global Environment Objective (GEO) was to promote the conservation and restoration of biodiversity in the state's grassland ecosystem in the Rio Grande do Sul's territory by mainstreaming biodiversity conservation within the forestry, agriculture and livestock productive landscapes.

2. This objective was set because:

- The Pampa's grasslands support high levels of biodiversity and are considered one of the most globally significant areas for endemic birds;
- The Pampa biome has gone through a process of intense land use change with the replacement of natural vegetation by pasture land, rice paddy crops, soybean and forests of alien tree species in recent decades threatening biodiversity conservation and imposing severe biodiversity losses;
- Cattle-ranching, sheep and livestock production are among the main regional economic activities and the natural grasslands are a source of forage for around 18 million animals and livelihood for thousands of rural families; and,
- The conservation of grasslands largely rely on the direct and indirect interdependence of humans and biodiversity.[30]

3. In much of the region, these land use changes occurred on soils that have an extremely sandy texture due to their sedimentary rock origin, and are fragile and highly sensitive to water and wind erosion. The natural fragility of the soil, the climatic conditions and the anthropogenic use of the land (including the introduction of alien grass species, conversion of native areas to agricultural lands, grazing areas and forest plantations with alien species) combined to cause intense soil degradation and change the natural structure of the plant/animal communities. The most recent official data available, from 2009, indicate that 35.6 percent of the natural vegetation of the Pampa Biome remained,[31] leading to losses of biodiversity, squandering socio-economic opportunities, and rendering the Pampa as the second most devastated biome in Brazil.

4. There was increasing evidence that sustainable land use in the grasslands is only possible if the economic activities are appropriately informed by the soil capacities and the adaptations of its plant and animals communities (Roesch et al, 2009). Consideration of the areas suitable for grazing, crop plantations, and forest establishment could help conserve areas for economic and ecological alternatives such as ecotourism. The use of native tree species in areas indicated for forest plantation could be a driver of conservation through on farm strategies. Many native tree species are very important due to their medicinal and economical uses. Planning conservation strategies for fauna and flora in the Pampa Biome took this interdependence in consideration and set the Project's Theory of Change (see figure below).

[30] Roesch et al, 2009. The Brazilian Pampa: A Fragile Biome. Diversity 2009, 1, 182-198.

[31] Brazil, Ministry of the Environment. Secretariat of Biodiversity and Forests - SBF. Fifth National Report to the Convention on Biological Diversity: Brazil. Brasília: Ministry of the Environment, 2015. 1. Biodiversity – Brazil. 2. Convention on Biological Diversity – Brazil.

PROJECT EXPECTED PILLARS SCENARIO

BIODIVERSITY IN THE STATE'S GRASSLAND ECOSYSTEM CONSERVED AND RESTORED AND BIODIVERSITY CONSERVATION MAINSTREAMED WITHIN THE FORESTRY, AGRICULTURE AND LIVESTOCK PRODUCTIVE LANDSCAPES

Farmers assisted to restore and maintain priority areas for biodiversity conservation in areas where ecosystem fragility and threats to biodiversity occur

Public Policies that (i) enhance the development of improved management systems and production practices (including creating awareness and building institutional capacity), (ii) secure the functions, dynamics and evolution of threatened ecosystems and endemic species and (iii) consolidate the network of protected areas within the biome implemented

PROJECT

- Demonstration Units
- Training events for rural producers
- Training in NRM for Technical Assistants
- On farm subprojects
- State conservation units with Improved Management Capacity
- Operational Database on Biodiversity
- Development and Implementation of Risk Prevention Plans
- Biodiversity educational and awareness events
- Broad dissemination of information on biodiversity
- Elaboration and implementation of strategies for biodiversity conservation
- Proposal of Conservation Corridor
- Strengthening of State Institutions in charge of biodiversity conservation
- Policies on Biodiversity conservation opportunities

ROOT CAUSES BASELINE SCENARIO

PAMPA IS THE SECOND MOST DEVASTATED BIOME IN BRAZIL: LOSS OF BIODIVERSITY, PRODUCTIVITY AND SOCIOECONOMIC

- Accelerated land conversion
- Use of inadequate agricultural technologies conversion to non-native pasture species
- Landholders not committed to environmental conservation
- Lack of information to promote biodiversity conservation
- Deficient regulatory framework for sustainable agriculture
- Insufficient monitoring surveillance and control

5. In this scenario and from a global perspective, the challenge that the Project addresses is to contribute to an overall increase in the protection status of Pampa Biome biodiversity and a widespread use of sustainable management practices both inside and outside protected areas.

6. To address this global challenge, Project design took into consideration the importance of the natural resource base for economic development, the relevant investment opportunities in the agricultural and non-agricultural sectors, and the different groups of stakeholders that should be engaged to achieve the Project's higher objectives.

7. The Project was designed aiming to strengthen policies and institutions to optimize performance of rural development and biodiversity conservation, to enhance knowledge about biodiversity conservation and sustainable rural production systems, to work mainly with the productive rural sectors (livestock and forestry), and to foster sound conservation practices that could be integrated into economic activities.

8. Project design combined three strategies/pillars to promote the conservation and restoration of biodiversity in the grassland ecosystems of Rio Grande do Sul:

- Promoting actions that assist farmers to restore and maintain priority areas for biodiversity conservation, where ecosystem fragility and threats to biodiversity occur;
- Conserving biodiversity by strengthening the implementation of public policies that enhance the development of improved management systems and production practices, including creating awareness and building institutional capacity; and
- Mainstreaming biodiversity conservation within forestry, agriculture and livestock productive landscapes.

9. These pillars would make a combined contribution for the achievement of the objective of the Project, which was to promote the conservation and restoration of biodiversity in the state's grassland ecosystem in the Rio Grande do Sul's territory by mainstreaming biodiversity conservation within the forestry, agriculture and livestock productive landscapes.

10. The achievement of the PDO/GEO was monitored and measured according to three Project Outcome Indicators:

- Project Outcome Indicator A – At least 500 rural properties with biodiversity conservation practices at the farm level in the Pampa (grasslands) biome;
- Project Outcome Indicator B – State conservation unit system improved with management plans and infrastructure of 10 conservation units, totaling 72,000 ha, under protection; and,
- Project Outcome Indicator C – State policy and regulatory framework incorporate measures to conserve biodiversity, including strategies for invasive alien species and natural resources management.

11. It is worth noticing that, during implementation, two core sector World Bank indicators were added at the Project outcome level to measure achievement of the Biodiversity Management and the On-farm Management components. These indicators are: The Project Outcome Indicator D - Areas brought under enhanced biodiversity protection (ha) and the Project Outcome Indicator E – Land users adopting sustainable land management practices as result of the Project. The PO Indicator D complements the original PO Indicator B, whereas the PO Indicator E complements the original PO Indicator A.

12. Closely following the above-mentioned strategy for achieving the PDO/GEO, the Project had two technical components and five subcomponents.

- The Component 1: *On-Farm Biodiversity Mainstreaming* focused on promoting the adaptation of biodiversity conservation practices in the main productive systems of the grasslands, aiming to rationalize land conversion processes. This Component was monitored according to four intermediate results indicators – namely:
    - Intermediate Outcome Indicator #1 – 12 demonstration units implemented with selected farms or group of farms;
    - Intermediate Outcome Indicator #2 – Around 2,000 producers participating in the Project through training events;
    - Intermediate Outcome Indicator #3 – 24 municipalities (ca. 80 percent of the municipal area) with at least one technician for training in natural resources management;
    - Intermediate Outcome Indicator #4 – 500 rural properties benefited with investments in productive activities that incorporates biodiversity conservation based on preliminary 10 practices.

- The Component 2: *Biodiversity Management* included strengthening the institutional capacity of four state agencies that are responsible for promoting and responsibly using biodiversity in Rio Grande do Sul, and promoting the consolidation of protected areas within the Project target area. This Component was monitored according to 9 intermediate results indicators – namely:
    - Intermediate Outcome Indicator #5 – 10 state conservation units with improved management capacity by management plans and/or infrastructure;
    - Intermediate Outcome Indicator #6 – At least 6 risk prevention plans developed and under implementation;
    - Intermediate Outcome Indicator #7 – Database on biodiversity, vegetation cover and other socio-environmental factors operational and widely available;
    - Intermediate Outcome Indicator #8 – Four areas with strategies for biodiversity conservation elaborated and under implementation by the state;
    - Intermediate Outcome Indicator #9 – 16 percent of priority area 1 with a conservation corridor proposed to the State Authorities;
    - Intermediate Outcome Indicator #10 – Development of at least 40 educational and awareness events related to biodiversity aimed at 4 areas schools and specific groups, considering the local characteristics;
    - Intermediate Outcome Indicator #11 – 63,000 inhabitants (40 percent of the rural population from the four priority areas) informed about biodiversity and its importance for conservation through environmental education;
    - Intermediate Outcome Indicator #12 – Four State Institutions in charge of biodiversity conservation strengthened for policy implementation;
    - Intermediate Outcome Indicator #13 – Proposal for incentives promoting biodiversity conservation opportunities.

13. The Project also had a third component focused on project management, monitoring and evaluation, and communication.

14. Although project management is a critical success factor, this Annex focuses on the activities, outputs, and outcomes of Components 1 and 2. It also addresses the Project's benefits and impacts on biodiversity and sustainable use of the Pampa Biome – i.e., the Project's theory of change, which is presented in Figure A2-1, below.

Component 1: On-farm Biodiversity Mainstreaming

Assumptions

15. The literature shows that areas of integral protection – i.e., protected areas with a conservation status that does not allow human interference – are not able to promote the conservation of the grasslands in the long-run. On the contrary, without management with grazing and/or fire many grassland areas are subject to shrub encroachment and subsequently change into forests, even though this may take decades depending on the local situation and the proximity to forest borders.[32] Therefore, full engagement of rural producers in more sustainable productive practices is a critical element for biodiversity conservation in the grasslands. This engagement calls for more informed decision-making choices and, consequently, information sharing and awareness raising.

Approach

16. Following these premises and endorsing the strategy of promoting actions that assist farmers to restore and maintain priority areas for biodiversity conservation, where ecosystem fragility and threats to biodiversity occur, the Project supported two complementary approaches outlined below.

17. On the one hand, the Project supported the piloting of sustainable production systems through (a) the implementation of Demonstration Units, Validation Units, and (b) subprojects within private landholdings. As part of the counterpart contribution, EMATER/RS provided technical assistance and monitored each subproject.

18. On the other hand, the Project also provided training to producers, and state and municipal technicians on sustainable natural resources and biodiversity management practices. In the production units, the Project assisted landholders to pursue agricultural and livestock activities that contributed to conserve productive grasslands and their biodiversity.

Outputs

19. The Project surpassed all targets envisaged for the four intermediate outcome indicators related to Component 1. The outputs from this component are presented below. Special emphasis is given to: (i) the assessment of the potential positive outcomes of the on-farm sustainable production practices piloted and disseminated by the Project for biodiversity conservation; and (ii) the evidences based on which this assessment was made.

Demonstration Units, Validation Units and Subprojects

20. The Project co-funded 31 Demonstration Units and two Validation Units established in private landholdings, whose owners volunteered to conduct sustainable practices. This ensured that the Project was able to provide valuable information, relevant experience, and delivered real benefits to local producers and to the environment.

21. The Project also co-financed 583 subprojects. Of these, six landholders dropped-out of the partnership. In these cases, the materials acquired for subprojects were relocated to other existing subprojects. Thus, by the end of the Project, 577 subprojects were fully implemented.

[32] G.E. Overbeck et al. / Perspectives in Plant Ecology, Evolution and Systematics 9 (2007) 101–116

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
1. Demonstration units implemented with selected farms or groups of farms	12	31	Achieved (258%)
4. Rural properties benefited with investments in productive activities that incorporate biodiversity conservation based on preliminary 10 practices	500	577	Achieved (115%)

22. Contributing to the conservation and restoration of biodiversity, seven production practices were mainstreamed into private landholdings: (i) management of grasslands; (ii) agroforestry system management; (iii) livestock forest management; (iv) native bees management; (v) organic fruits production; (vi) medicinal plants; and (vii) organic grains and vegetables production.

23. The total area managed under the Project was 5,056.33 hectares. The average cost per subproject was RS$ 5,491.5 /US$1,569 and covered equipment, materials, seeds, etc. The PAD planned an average allocation of US$ 3,600 per producer. Therefore, in the end, the average cost per subproject in US dollars was 43 percent less than initially planned allowing for an increase in the projected outcome.

Table A2.1 – Outputs of Component 1 – Demonstration and Validation Units and On-farm Subprojects by priority Geographic Area.

Priority Area	Project Investments (number)			Families (number)	Managed area (hectares)
	Subprojects (SP)	Demonstration Units (DU)	Validation Units (VU)		
Campos da Campanha	129	9	0	139	2,433.02
Litoral Médio	115	8	2	125	428.60
Quarta Colônia	250	8	0	258	655.66
Escudo Sul	83	6	0	89	1,538.75
Total	577	31	2	611	5,056.33

Table A2.2 – Outputs of Component 1 – Demonstration and Validation Units and On-farm Subprojects by Sustainable Production Practice.

Sustainable production practices	SP	DU	VU
Sustainable grassland management system	388	24	--
Agroforestry management systems (cropland-livestock-forestry)	93	4	--
Agroforestry management systems (livestock-forestry/silvopastoral)	16	1	2
Native bees management	6	--	--
Organic fruits production	16	1	--
Organic grains and vegetables production	49	1	--
Medicinal plants	9	--	--

Table A2.3 – Area under sustainable management by sustainable productive practice.

Sustainable Production Practices	Area (hectares)
Sustainable grassland management systems	4,393.36
Agroforestry management systems (cropland-livestock- forestry)	103.15
Organic grains and vegetables production	96.60
Organic fruit production	36.62
Agroforestry management systems (livestock- forestry/silvopastoral)	25.05
Native bees management	10.50
Medicinal plants	7.70

24. Results from one case study related to the implementation of the practice of sustainable grassland management system – the practice that has been more broadly supported (counting for about 94 percent of the area under sustainable management practices

supported by the Project) – show that, when adopting this system, producers have achieved relevant productivity and economic outcomes. This case study refers to a family farm in which the Project supported the implementation of a demonstration unit of grazing systems using native pastures. This family farm is located in the municipality of Caçapava do Sul. This farm held a grazing management area equal to 27 hectares of native pasture. The grazing plan split the area in 22 paddocks and maintained a stocking density equal to 3.2 animals per hectare. After the adoption of the new grazing system, the carrying capacity of its paddocks increased 46 percent and achieved live weight gains equal to 298.6 kg/ha as well as average daily gains of live weight of steers equal to 0.536 Kg/day. Based on the current average price of live-weight steers in the state of Rio Grande do Sul (equal to Brazilian reais 5.33/Kg),[33] this biodiversity conservation practice and production system has yielded incremental financial returns in the order of US$ 12,000 in the first year under the new grazing system (for a project investment lower than US$ 5,000). These outcomes on the carrying capacity of the paddocks and on the average daily gains of live weight of steers are consistent with the evidences found in the literature (see the subsequent table).

25. In the following matrix of results, we summarize the assumptions supporting the implementation of the selected sustainable production practices.

[33] Source: EMATER-RS, http://www.emater.tche.br/site/arquivos_pdf/precos/preco_27052016.pdf

Matrix of Results A2.1 – Biodiversity Conservation Potential (and Socioeconomic Co-benefits) of Supported Sustainable Production Practices.

Sustainable Production Practices	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/ Supporting Literature
Sustainable grassland management	Livestock is one of the most important productive activities in the grassland landscape in the Pampa Biome. Evidences from the scientific literature show that livestock have widespread direct and indirect impacts on biodiversity and these impacts are mostly negative. Negative impacts of livestock on biodiversity include: heavy grazing on plants; soil compaction; deforestation and forest degradation due to expansion of pastures and cropland; diseases spread by livestock to wildlife; simplification of landscapes through use intensification and fragmentation; competition of livestock with wildlife; and pollution of watercourses with nutrients, drugs. Positive impacts occur when livestock production is more efficient and fewer natural resources are used for each kilogram of meat or eggs produced. Moderate grazing increases species diversity and sustainable pastoral land use management protects wildlife biodiversity. Sustainable livestock management involves choosing and managing forages, soil fertility, fencing, water distribution, harvesting, invasive species control, grazing rotation, and compliance with the Forest Code, among others practices. In short, this practice is expected to reduce soil erosion; natural landscape maintenance; prevent the spread of invasive species; reduce fertilizer inputs; increase biomass; restore degraded pasturelands; and generate income.	The Project worked with local landholders focusing on improving sustainable livestock management, natural grazing rotation, genetic improvement of livestock, control of invasive grass species, improvement of forages, fencing management, and optimal stock management. For example, fencing is an important element of grassland sustainable management. Electric fences allow controlling the movement of animals, and isolating natural fragile areas and springs. The Project co-funded 388 subprojects and 24 demonstration units for activities related to grassland management systems, totalizing 412 beneficiary families and 4,393.36 ha. The results of these subprojects show that (i) the stocking rate could be increased without land use conversion of any additional area, and (ii) the net financial returns from livestock could increase, while (iii) reducing the grazing pressures on the Pampa Biome.	The sustainable grassland management systems supported by the Project can have contributed to promote biodiversity conservation, reducing pressure from pastures planted with alien invasive species, controlling invasive species, restoring natural grassland landscapes, and avoiding soil erosion. Finally, by restoring degraded pasturelands and enhancing integrated cropland-livestock-forestry systems, the Project also contributed to the Brazil Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change (NDC). Brazil Nationally Determined Contribution towards achieving the objective of the United Nations Framework Convention on Climate Change includes restoring an additional 15 million hectares of degraded pasturelands by 2030 and enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030.	Herrero, M. et al. Livestock, livelihoods and environment: understating the trade-off. *Current Opinion on Environmental Sustainability*. 2009, 1:111-120. Reid, R.S. et all. Global Livestock impacts on Biodiversity. In: Steinfeld, H. Mooney. H., Scheneider. F. Neville (eds), *Livestocking in a changing Landscape: Drivers Consequences, and Response*. Island. 2009.

Sustainable Production Practices	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/ Supporting Literature
Agroforestry systems management (cropland-livestock- forestry)	In the literature, agroforestry is defined as a dynamic, ecologically based natural resource management practice that, through the integration of trees and other tall woody plants on farms and in the agricultural landscape, diversifies production for increased social, economic, and environmental benefits Agroforestry is increasingly recognized as a useful and promising approach to natural resource management because it combines sustainable agricultural development for resource-poor farmers with greater environmental benefits than less diversified agricultural systems, pastures, or monoculture plantations. In landscapes that are mosaics of agricultural areas and natural vegetation – as the Pampa grassland – the conservation value of the natural vegetation is greater if it is embedded in a landscape dominated by agroforestry elements than if the surrounding areas consists of crop fields and pastures largely devoid of tree cover. Agroforestry can contribute to biodiversity conservation in productive landscapes by reducing pressure to deforest additional land for agriculture and providing habitat and resources for partially forest-dependent native plant and animal species that would not be able to survive in a purely agriculture landscape. In short, this practice is expected to enhance soil fertility, reduce soil erosion, improve water quality, enhance biodiversity and sequester carbon.	The Project funded 93 subprojects and four demonstration units focusing on crop-livestock-forestry and livestock-forestry/silvopastoral systems, totaling 103.15 ha. These subprojects benefited 116 families and the Project priority areas in the Atlantic Forest Biome. Agroforestry practices included: (i) banana, passion fruit, lemon and orange production into degraded forest areas; (ii) banana, pumpkins and crop plantation within forest regeneration areas; (iii) fruit production within degraded forest on slopes; and, (iv) incorporating trees in pastures to provide shade for livestock.	Agroforestry could contribute to biodiversity conservation in productive landscapes by: (i) reducing pressure to deforest additional land for agriculture; (ii) providing habitat and resources for partially forest-dependent native plant and animal species that would not be able to survive in a purely agricultural landscape; and (iii) conferring suitability to landscapes as habitat for native fauna and flora. All of these are effects that reach beyond the limits of an individual agroforestry system and extend to the entire landscape. Therefore, the agroforestry systems supported by the Project are expected to make a substantial contribution to the long-term viability of biodiversity conservation in productive landscapes in Rio Grande do Sul.	Schroth et al (ed). *Agroforestry and biodiversity Conservation in Tropical Landscapes*. Island Press. 2004. 537pp.

Agroforestry systems management (livestock- forestry/silvopastoral)	The expansion of cattle raising is considered one of the major drivers of deforestation and forest degradation due to conversion of forest areas to pasturelands as well as of losses of the native vegetation cover and biodiversity due to the replacement of native grasses by alien species. Livestock production systems have led to losses on soil fertility, decreasing fodder capacity and declining production of meat and milk. The combination of agroforestry with livestock – i.e. the association of rotational grazing systems for livestock with arboreal crops with rational water management in the same plots of land – has emerged as a profitable and sustainable management system for livestock and milk production. Integrated agroforestry and pasture systems contribute to diversification of production, improve the use of land and labor, and promote income generation. Productive and economic gains are achieved while increasing environmental services in relation to biodiversity. These systems allow for more efficient nutrient cycling processes and use of solar energy, control of wind and water soil erosion, increased fodder quality, and conservation of biodiversity. They are efficient carbon sinks and constitute a renewable source of energy. They contribute to the recovery of degraded soils and provide a better control of temperature, relative humidity in the air, and soil moisture as well as for increased nitrogen availability in the soil, leading to increasing yields of agricultural crops and pastures. They reduce the effects of seasonality of fodder production and prolong the period of vegetative growth of grasses. Finally, there is growing evidence that these systems are efficient for raising milking cows because they provide thermal comfort to these animals, improve diet quality, increase the carrying capacity and livestock production (daily gains of live weight of animals and milk production *per capita*). In short, this practice is expected to enhance soil fertility and biodiversity, reduce soil erosion, improve water quality, and enhance productivity.	The Project benefited 19 families through 16 subprojects, one demonstration unit and two validation units combining agroforestry systems and milk production, totaling 25.05 ha.	As mentioned above, agroforestry could contribute to biodiversity conservation in productive landscapes by: (i) reducing pressure to deforest additional land for agriculture; (ii) providing habitat and resources for partially forest-dependent native plant and animal species that would not be able to survive in a purely agricultural landscape; and (iii) conferring suitability to landscapes as habitat for native fauna and flora, that is. All of these are effects that reach beyond the limits of an individual agroforestry system and extend to the entire landscape. The agroforestry systems supported by the Project are expected to make a substantial contribution to the long-term viability of biodiversity conservation in productive landscapes in Rio Grande do Sul.	Carvalho et al. Potencial produtivo do campo nativo do Rio Grande do Sul. In: Patiño, H.O. (Ed.). Suplementação de Ruminantes em Pastejo, 1, Anais, Porto Alegre-RS. 1998. Murgueitio et al. Produção de Leite Com Sistemas Silvipastoris Intensivos, http://www.lerf.esalq.usp.br/divulgacao/recomendados/artigos/uribe2011.pdf. Paciullo et al. Sistemas Silvipastoris na Pecuária Leiteira, http://www.cnpgl.embrapa.br/totem/conteudo/Meio_ambiente_e_bem_estar_animal/Outras_publicacoes/Sistemas_silvipastoris_na_pecuaria_leiteira.pdf Ribaski and Montoya, Sistemas silvipastoris desenvolvidos na região Sul do Brasil: a experiência da Embrapa Florestas. In: Simpósio Internacional: Sistemas Agroflorestais Pecuários na América do Sul, 2000, Juiz de Fora. **Anais...** Juiz de Fora: Embrapa Gado de Leite/FAO, 2000. I CD ROM. Ribaski et al. Sistemas agroflorestais: aspectos ambientais e sócio-econômicos. *Informe Agropecuário*. V.22, n. 212, p. 61-67, 2001. Wildin, *Trees for forage systems in Australia*. Queensland Department of Primary Industries. Rockhampton, Australia, 1990. 43p. Young, *Agroforestry for soil management*. Second Edition. CAB International, 1997. 320p.

Native bees management	Pollination is an ecosystem service that is essential to support the production of a wide range of crops. Its value derives from its contribution to the maintenance of ecosystems as well as its impact on agricultural productivity. The service is increasingly under threat as a consequence of, among others, habitat loss for pollinators and the increasing use of pesticides. At the local scale, the value of the service is highly variable depending on the crop and the market conditions. At the national scale, value estimates of the pollination service range from 1% to 16% of the market value of agricultural production. In recent years, Brazil supported the development and dissemination of various studies on the benefits from wild pollinator species, particularly bees. These studies demonstrate that the adoption of agricultural practices that allow the conservation of these species actually contribute to increase productivity in agricultural systems, as well as to increase the income of rural producers. The Brazilian social bees, sub-tribe Meliponini, are considered the main pollinator agents of the Brazilian trees. There are more than 200 different Meliponini species, including the stingless bees, and some of them are frequently raised for honey production. In short, this practice is expected to foster the maintenance of the natural landscape; maintenance of pollination services and native biodiversity of plants; decrease the risk of extinction of native bees; promote livelihood diversification, increase agricultural yields and income generation.	The Project co-funded six subprojects focused on teaching beekeepers how to divide the colonies, ways of splitting the nests, how to keep and conserve their honey, how to prevent colonies from contamination by agricultural activities, and how to use bee services and conserve their populations. These subprojects benefitted 6 families and 10.50 ha. In addition, the Project supported the publication of a manual on best practices and conservation guidelines for the management of native bees. Five thousand hard copies of this manual have been distributed among rural producers and an electronic version of the document is available at http://www.semabelhasemalimento.com.br/wp-content/uploads/2015/02/Meliponicultura-manual.pdf.	At the local level, native bees' management contributes to biodiversity conservation, pollination services, maintenance of natural landscape, as well as to increase agricultural yields and income for local landholders. Globally, these subprojects contribute to the implementation of the Convention on Biological Diversity (CBD) and Aichi biodiversity target 7, and Brazil Biodiversity Targets commitments – namely: Brazil target 7: By 2020, the incorporation of sustainable management practices is disseminated and promoted in agriculture, livestock production, aquaculture, silviculture, extractive activities, and forest and fauna management, ensuring conservation of biodiversity.	Brazil, Ministry of the Environment. Secretariat of Biodiversity and Forests - SBF. Fifth National Report to the Convention on Biological Diversity: Brazil. Brasília: Ministry of the Environment, 2015. (https://www.cbd.int/nbsap/targets/default.shtm). Viana et al., *How Well Do We Undestand Landscape Effects on Pollinators and Pollination Services? Journal of Pollination Ecology*, 7(5), 2012, pp 31-41. Mburu, John et al. *Tools for Conservation and Use of Pollination Services – Economic Valuation of Pollination Services: Review of Methods*. Food and Agriculture Organization of the United Nations/Centre for Development Research, University of Bonn, 2006 (http://www.fao.org/fileadmin/templates/agphome/documents/Biodiversity-pollination/econvaluepoll1.pdf). Lars Hein, "The Economic Value of the Pollination Service, a Review Across Scales", The Open Ecology Journal, 2009, 2, 74-82 (http://www.bentham-open.com/contents/pdf/TOECOLJ/TOECOLJ-2-1-74.pdf). The Nature Conservancy, "Native Pollinators and Apples and Peaches: Analysis of Native Pollinator Benefits to New Jersey Farms" (http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newjersey/nj-tree-fruit-fact-sheet.pdf). Associação Brasileira de Estudos das Abelhas, *Agricultura e Polinizadores*. São Paulo: 2015.

Sustainable Production Practices	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/ Supporting Literature
Organic Production of fruits, vegetables and grains	The literature highlights that the intensification and expansion of modern agriculture is amongst the greatest current threats to worldwide biodiversity. Organic farming is characterized by the prohibition of applying a majority of synthetic chemicals in both crop and livestock production. Overall, organic agricultural methods are more environmentally sustainable than intensive or conventional agriculture, which is dependent on the routine use of herbicides, pesticides and inorganic nutrient applications in the production of crops and animals. In short, this practice is expected to reduce the use of chemical pesticides; foster biological pest control; improve water management; improve local biodiversity; promote livelihood diversification, increase access to niche markets and promote income generation.	The Project supported 67 family farmers to develop organic production of fruits, grains and vegetables (65 subprojects and two demonstration units), totaling 133.22 ha. Complementarily, the Project supported the access of organic products to local markets.	Compared with conventional methods, organic agriculture is reported to increase diversity in the agricultural landscapes. Organic management can reduce the use of chemical pesticides; promote biological pest control; and improve water management. Although the Project does not measure the effects of organic farming on Rio Grande do Sul's biodiversity composition and abundance, it is clear that organic farming has the potential to contribute to biodiversity maintenance.	Bengtsson, J. et all. The effects of organic agriculture on biodiversity and abundance: a meta-analysis. Journal of Applied Ecology. Vol 42, issue 2, April 2005. Pages 261-269. *Dritschilo, W. & Wanner, D. (1980) Ground beetle abundance in organic and conventional cornfields. Environmental Entomology, 9, 629–63.* *Fahrig, L. & Jonsen, I. (1998) Effect of habitat patch characteristics on abundance and diversity of insects in an agricultural landscape. Ecosystems, 1, 197–205.* *Hyvönen, T., Ketoja, E., Salonen, J., Jalli, H. & Tiainen, J. (2003) Weed species diversity and community composition in organic and conventional cropping of spring cereals. Agriculture, Ecosystems and Environment, 97, 131–149.*

Sustainable Production Practices	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/ Supporting Literature
Medicinal plants	According to the International Union for Conservation of Nature (IUCN), about 15,000 medicinal plant species may be threatened with extinction worldwide. Wild harvesting of medicinal plants and small-scale cultivation provide a diversified and additional source of income to family farmers and forest-dependent people. Supplies of wild medicinal plants are at increasing risk from destruction of their habitats by deforestation for logging and conversion to plantations, pasture and agriculture, bioprospecting for new sources, and overharvesting of known medicinal species to satisfy local, regional and international markets. Overharvesting of species poses a significant threat to some commercially valuable wild species and to their habitats as well as to the access to traditional remedies by indigenous peoples and traditional communities. Sustainable harvest of wild populations under sustainable management schemes is the priority conservation option, but faces major challenges, which include: poverty and the break-down of traditional controls, the lack of knowledge about sustainable harvest rates and practices, undefined land use rights and lack of legislative and policy guidance. Sustainable harvest of wild populations needs to be supported by governments and authorities. Small-scale cultivation of medicinal plants is a response to declining local stocks. It is widely viewed not only as a means for meeting current and future demands for large volume production of plant-based drugs and herbal remedies, but also as a means for relieving harvest pressure on wild populations. However, with respect to economic viability many highly endangered wild medicinal plants do not qualify for cultivation and will enter cultivation only with the help of public domestication programs. Involving local communities was found to be fundamental to conserving medicinal plants at the local level. This practice is expected to foster the maintenance of the natural landscape; maintain native biodiversity; improve human welfare; and maintain traditional knowledge.	Nine subprojects were supported benefitting 9 families, totaling 7.70 ha.	At the local level, the support to cultivation of medicinal plants contributes to the policy on medicinal plants and herbal medicines of the state of Rio Grande do Sul (State Law 12560/2006), which aims to foster the cultivation and commercialization of medicinal plants and herbal medicines. Globally, this sustainable practice is a contribution to targets of the Global Convention on Biological Diversity (Article 8 on Traditional Knowledge, Innovations and Practices), which proposes curbing overexploitation and destructive bioprospecting of medicinal plants by developing procedures to that end. It also contributes to targets under the Global Strategy for Plant Conservation (GSPC), including: Target 7 (Sixty percent of the world's threatened species conserved in situ); Target 9 (Seventy percent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained); and Target 12 (Thirty percent of plant-based products derived from sources that are sustainably managed).	Schippmann, Leaman and Cunningham, *Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues*, in. FAO 2002 – *Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries*. Satellite event on the occasion of the Ninth Regular Session of the Commission on Genetic Resources for Food and Agriculture. Rome, 12-13 October 2002. IUCN Species Survival Commission Medicinal Plant Specialist Group. 2007. "Why Conserve and Manage Medicinal Plants?" Web resource: www.iucn.org/themes/ssc/sgs/mpsg/main/Why.html. International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) Version 1.0, 2007. http://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Standard_Version1_0.pdf. Secretariat of the Convention on Biological Diversity, *The Convention on Biological Diversity Plant Conservation Report: A Review of Progress in Implementing the Global Strategy forPlant Conservation (GSPC)*, Montreal, 2009.

Training and Capacity building events for producers

26. Component 1 also supported training for rural producers and rural technical assistants on sustainable agriculture and natural resources management. Supported activities included the carrying out of environmental education workshops and classes, field-days, and workshops of knowledge exchange on relevant practices, where information on sustainable agricultural practices and on the use of natural resources was provided to rural producers. In these events, the methodological approach followed by EMATER involved offering technical advice, helping farmers to analyze problems and identify opportunities, sharing information among themselves, supporting group formation and facilitating collective action.

27. The Project outputs related with training and capacity building in sustainable agricultural practices and natural resources management largely surpassed the Project's targets. Project achievements confirm the producers' interest on knowledge transfer as well as the need to improve dissemination of sustainable management practices.

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
2. Producers participating in the project through training events	2,000	8,571	Achieved (426%)

28. In total, 174 training events for rural producers have been offered during the Project life cycle. The table below shows the number and percentage of training events provided to rural producers and the number and percentage of participants by each type of event.

Table A2.4 – Training Events and Participation of Rural Producers by type of event.

Type of Event	Number of Events	Percentage of Events	Number of Participant Producers	Percentage of Participants
Field days for knowledge exchange	83	48%	4,832	56%
Relevant Practices knowledge exchange workshops	33	19%	1,454	17%
Environmental Education Workshops	28	16%	1,217	14%
Environmental Education Classes	30	17%	1,068	12%
Total	174	100%	8,571	100%

29. The table below shows the number and percentage of training events provided to rural producers and the number and percentage of participants by each selected priority area.

Table A2.5 – Training events and Producers Participation by Priority Area.

Selected Priority Area	Number of Events	Percentage of Events	Number of Participant Producers	Percentage of Participants
Quarta Colônia	58	33%	3,291	38%
Campos da Campanha	47	27%	2,405	28%
Escudo Sul-rio-grandense	22	13%	1,084	13%
Litoral Médio	47	27%	1,791	21%
Total	174	100%	8,571	100%

30. In addition to this, the Project supported EMATER/RS institutional strengthening, and promoted training events focused on natural resources management and low-impact agriculture for its rural technical assistants. The Project has also surpassed its original target of having 24 municipalities within the priority areas with at least one rural technical assistant trained in natural resources management.

Related Intermediate Outcome Indicator	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
3. Municipalities with at least one technician for training in natural resource management	24	33	Achieved (138%)

31. Thus, at the end of the Project, eighteen capacity-building events had been carried out, convening 434 participants from 43 municipalities – including all 33 municipalities in the Project's priority areas.

32. The table below shows the number of training events for state rural technical assistants and the number of participants by each selected priority area.

Table A2.6 – Training Events and Participation of State Technical Assistants by priority area.

Priority Area	Training Events	Percentage of Events	Number of Technicians	Percentage of Technicians
Quarta Colônia	7	41%	184	45%
Campos da Campanha	5	29%	108	26%
Escudo Sul-rio-grandense	2	12%	68	17%
Litoral Médio	3	18%	51	12%
Total[34]	17	100%	411	100%

Assessment of Component 1 Outcomes

33. Taking into account the assumptions and evidences presented on the sustainable production practices piloted and disseminated by the Project, the ICR concludes that:

- Project investments in Demonstration Units, Validation Units, and On-farm Subprojects have proven to be an adequate approach in pursuing the complementary goals of (i) engaging and assisting farmers to restore and maintain priority areas for biodiversity conservation, whereas (ii) increasing their opportunities for productive and socioeconomic gains.
- The sustainable production practices introduced and disseminated by the Project made a substantial contribution – although in a small-scale – to biodiversity conservation outcomes.

34. The ICR also considers that the huge interest manifested by producers (as expressed by the large number of participants in training events) on knowledge exchange opportunities to learn about sustainable production practices and natural resources management is a testimony of the potential for scaling-up the dissemination of these practices.

35. In addition, the ICR agrees that through the training events provided for state rural technical assistants, the Project has positively contributed to the institutional capacity

[34] In addition to the events shown on this table, one training event was held at the state capital city (Porto Alegre), convening 23 rural technical assistants from EMATER/RS.

building of EMATER/RS, as well as to the replication of sustainable management practices into others landholdings throughout the EMATER/RS technical assistance network.

36. Consequently, the ICR concludes that Component 1 has substantially contributed to restoring and mainstreaming biodiversity within the forestry, agriculture and livestock productive landscapes and to biodiversity conservation in the grassland ecosystems.

Component 2: Biodiversity Management

37. Component 2 addresses the pillar of strengthening public policies, regulatory framework and institutional capacity needed to improve management systems, secure the functions, dynamics and evolution of threatened ecosystems and endemic species, and consolidate the network of protected areas within the Pampa biome.

38. Thus, Component 2 followed two strategies envisaged under the Project's overall approach. It supported activities that contributed to the conservation of biodiversity by strengthening the implementation of public policies, which enhanced the development of improved management systems and production practices including awareness raising and institutional capacity building. And it also included activities that contributed to securing the functions, dynamics and evolution of threatened ecosystems and endemic species by consolidating the network of protected areas within the biome.

39. Component 2 was implemented through three subcomponents: (i) protecting species and sites; (ii) improving the state's regulatory framework and promoting institutional strengthening; and (iii) increasing environmental awareness and promoting information on biodiversity.

40. The component focused on managing biodiversity and protected areas (with high habitat quality and niches to ensure critical elements for habitat or ecosystem services). Key strategies to facilitate this process were:

- The consolidation of selected protected areas and the proposal of an ecological corridor;
- Knowledge generation and operationalization including the development, dissemination and implementation of: studies and assessments of the biodiversity conservation status in the Pampa biome and the threats it faces; conservation, risk prevention, and biological invasion control; plans for priority areas and threatened endemic species;
- The development and carrying out of education and awareness raising events and materials related to biodiversity; and,
- The provision of training and institutional capacity building events for state agencies in charge of biodiversity conservation, including the strengthening and innovation of the state regulatory framework and public policies concerning biodiversity conservation.

Assumptions

41. The choice of this strategic set of activities for investing on biodiversity conservation is fully aligned with a set of widely shared and increasingly evidenced assumptions. This sub-section briefly describes these assumptions.

Consolidation of Selected Protected Areas and Proposal of an Ecological Corridor

42. Protected areas are of crucial and growing importance because of several reasons. They safeguard many of the world's outstanding areas of living richness, natural beauty and

cultural significance, which are an irreplaceable asset of the countries to which they belong. They help to maintain the diversity of ecosystems, species, genetic varieties and ecological processes (including the regulation of water flow and climate), which are vital to support all lives on Earth and to improve human social and economic conditions. They also protect genetic varieties and species, which are vital in meeting humans needs (for example in agriculture and medicine) and are the basis for humans' social and cultural adaptation in an uncertain and changing world. They are often home to communities of people with traditional cultures and irreplaceable knowledge on nature and provide major direct and indirect benefits to local and national economies. They have significant scientific, educational, cultural, recreational and spiritual values. Additionally, protected areas are needed to safeguard biological diversity in its own right and as an asset for the future.

43. The creation and consolidation of protected areas is one of the most effective tools to promote biodiversity conservation. The objectives of Protected Areas range from the integral protection of biodiversity and ecosystems to the sustainable management of specific natural resources. They are also relevant for their potential for ecotourism, environmental education and awareness raising and scientific research.[35]

44. Furthermore, in the state of Rio Grande do Sul there are 34 federal and state Protected Areas (27 of integral protection and seven of sustainable use) comprising a total area of 721,666 ha (2.6 percent of the state territory). These protected areas have not been able to effectively fulfill their primary objectives and face huge challenges, such as land regularization, human resources, small area and lack of connectivity, incipient processes of elaboration and implementation of management plans.[36]

45. Nevertheless and as mentioned in the literature, Protected Areas alone cannot provide sufficient habitat for wide ranging species or sustain viable populations of all species. Ecological corridors – routes that facilitate movement of organisms between habitat fragments – are increasingly being adopted as a tool to maintain and restore biodiversity.[37]

46. Ecological connectivity may benefit biodiversity in a number of ways. Maintaining and restoring connectivity often means maintenance or enhancement of natural habitat; as a result, one obvious benefit can be increased habitat. In addition, corridors should permit greater species richness, the potential for more individuals within a species community by providing more home range sites and contributing for the conservation of small populations that are constrained by human activities. Increased connectivity can also facilitated dispersal, increase overall species' persistence, increase genetic interchange among plant and animal species' populations increasing levels of genetic variability within populations, and leading to increased species resilience to environmental changes. Finally, corridors can help retain healthy functioning ecosystems.[38]

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[35] Milano, M.S. 1997 Unidades de Conservação. Conceitos Básicos e princípios gerais de planejamento, manejo e administração. In *Curso de Manejo de Áreas Protegidas*. Curitiba: Unilivre, p. 1-60. Bensusan, N. 2006 *Conservação da Biodiversidade em Áreas Protegidas*. Rio de Janeiro: Editora FGV.

[36] Neely, J. 1994. Protected areas for the 21st Century: working to provide benefits to society. *Biodiversity and Conservation* 3, 390-405.

[37] Hilty, Lidicker Jr. and Merenlender, Corridor Ecology: the science and practice of linking landscapes for biodiversity conservation. 2006. Island Press. 345pp.

[38] Furthermore, "corridors or strips of natural habitat can also be beneficial in agricultural systems. Hedgerows and other linear habitats can help limit soil loss due to wind and water erosion. Natural vegetation buffers at field margins can reduce the drift of pesticides into residential communities, into waterways, and between fields, and species harbored within more natural vegetated corridors may also play important pollinating roles" (Hilty, Lidicker Jr. and Merenlender: 2006).

Knowledge Generation and Operationalization: Studies, assessments, conservation plans, risk prevention plans and biological invasion control plans

47. Knowledge generation on specific threats to endemic, rare, or threatened species and/or those of economic, medicinal or scientific interest is a key aspect for an improved management of environmental resources and for biodiversity conservation in the Pampa biome. Knowledge generation is critical for the preparation of ecological-economic zoning of the grassland region and for improving the process of environmental licensing, establishing standards, criteria and processes.

48. Invasive alien species lead to the transformation of entire landscapes and are important components of environmental change in Brazilian ecosystems based on the trend of decreased biodiversity in invaded areas. Invasive species are one of the most severe threats to the conservation of native species, communities and ecosystems and require urgent attention. The extinction of genetically distinct populations may be the least reversible of all global changes, and there is clear evidence that biological invasions contribute substantially to an increasing rate of extinctions. [39] In the south of Brazil, this is particularly the case of the alien *Pinus* species and *Eragrostis plana* (annoni grass), which are replacing steppe habitat and natural grasslands with simplified forest habitats.[40] Nevertheless, more research and action are urgently needed to address drivers and consequences of biological invasions.[41]

49. Meanwhile, the grassland management and the livestock performance may reveal tools capable of decreasing or containing the abundance of these invasive species and improving biodiversity and productivity of the natural grassland.

Education and Awareness Raising

50. *Agenda 21,* the internationally agreed report of the Earth Summit, committed countries to promoting environmental sustainability through education. Chapter 36 on "Promoting education, public awareness and training" was one of the few aspects of Agenda 21 that did not provoke contention at the Earth Summit. Countries from both North and South agreed that education – including formal education, public awareness and training – was critical for promoting sustainable development and increasing the capacity of the people to address environment and development issues. (Agenda 21, Chapter 36).

51. Since then, a series of major international reports have emphasized the critical role education can play in the search for sustainable living. Thus, it is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Education, to be certain, is not the whole answer to every problem, but is a vital part of all efforts to imagine and create new relationships among people and to foster greater respect for the needs of the environment.[42] It is also widely agreed that, in order to change

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[39] Vitousek, P.M. et al. 1996. Biological invasions as global environmental change. American Scientist 84:468-4787.

[40] Guadagnin, D. et al, Árvores e arbustos exóticos invasores no Pampa: questões ecológicas, culturais e sócio-econômicas de um desafio crescente. In Pillar V. et al (eds.) 2009. *Campos Sulinos: Conservação e Uso Sustentável da Biodiversidade*. Brasília/DF: Ministério do Meio Ambiente, p. 300-316.

[41] *Brazil: Fifth National Report to the CBD*: 2015; Zenni, R.D.; Ziller, S.R., 2011. An overview of invasive plants in Brazil. Revista Brasileira de Botânica, Vol. 34(3), p.431; and, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, 2013. Relatório de Qualidade do Meio Ambiente – RQMA: Brasília, IBAMA/Diretoria de Qualidade Ambiental, 268 p.

[42] UNESCO-UNEP, Education for sustainable development", in *Connect* XXI (2) June 1996; UNESCO, *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*. Report of the

unsustainable production and consumption patterns and lifestyles, it is essential to give great emphasis to the role of education for sustainable development, including environmental economics as well as environmental awareness.[43]

52. The United Nations declared 2005 to 2014 the Decade of Education for Sustainable Development. The overall goal of this agenda was to utilize education as a means of integrating the principles of sustainable development with human values and perspectives in order to create a sustainable society.[44] Communication, Education and Public Awareness are also recognized as an essential part of achieving the objectives of the Convention on Biological Diversity.[45]

53. As stated by UNESCO, education for sustainable development means including key sustainable development issues into teaching and learning. It promotes competencies such as critical thinking, imagining future scenarios and making decisions in a collaborative way.

54. Therefore, a fundamental prerequisite for bringing about changes towards sustainable development is an adequately financed and effective educational system at all levels, that includes non-formal and informal modes of teaching and learning (e.g., within the family and community), and emphasizes the need for a broader, participatory approach for education for sustainability, which takes into account "local needs and values".[46]

55. Although education and communication are important tools for conservation, there are few studies on the costs and benefits of different forms of education within the field of environmental conservation. Furthermore, providing evidence that education does have a direct effect on environmental behavior and therefore on conservation success requires specific studies.[47]

Institutional Capacity Strengthening for Biodiversity Conservation

56. Institutional capacity strengthening is often mistakenly equated with training. Training is just a part of institutional capacity strengthening, which shall be understood as a complex set of different activities, including the provision of incentives, equipment, infrastructure and training, and also the implementation of policy-dialogue activities aimed at promoting an enabling environment for broader institutional innovations and expansion to facilitate scaling up.[48]

International Conference on Environment and Society: Education and Public Awareness for Sustainability, Thessalonikki: Greece, 1997.

[43] UNESCO-UNEP, Education for sustainable development", in *Connect* XXI (2) June 1996

[44] http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/

[45] https://www.cbd.int/convention/

[46] Commission on Sustainable Development (1998). *Transfer of Environmentally Sound Technology, Capacity-building, Education and Public Awareness, and Science for Sustainable Development*. Report of the Sixth Session 20 April to 1 May 1998 CSD; Tilbury, D., Stevenson, R.B., Fien, J. and Schreuder, D. (eds.), Education and Sustainability: Responding to the Global Challenge. IUCN Commission on Education and Communication (CEC)/IUCN – The World Conservation Union 2002.

[47] Howe, C. The role of education as a tool for environmental conservation and sustainable development. A dissertation submitted for the degree of Doctor of Philosophy at Imperial College London. 2009. http://www.iccs.org.uk/wp-content/thesis/phd-howe,caroline09.pdf

[48] Anyonge, T. et al. 2013. Strengthening institutions and organizations. IFAD 66pp.

Approaches

Consolidation of Selected Protected Areas and Proposal of an Ecological Corridor

57. The Project's four priority areas were defined according to four main criteria: (i) areas of extreme importance for biodiversity conservation according to the Brazilian Ministry of the Environment; (ii) occurrence of threatened ecosystems or species; (iii) existence of opportunities with potential incremental activities; and (iv) occurrence of protected areas. Ten state protected areas located within the four priority areas were selected to be consolidated according to priorities for their strengthening, summing up 72,204 hectares. Component 2 advanced the consolidation of these protected areas by investing in equipment, durable goods and infrastructure, the preparation of management plans, the carrying out of environmental education and staff capacity building events. These activities were exclusively supported by state counterpart resources available through the Compensatory Measures program.

58. Component 2 supported the participatory design – including the engagement with key stakeholders – and legal proposal of the Quarta Colônia Ecological Corridor. The preliminary proposal of this ecological corridor was presented and discussed with stakeholders throughout the planning process to incorporate their feedback. Engaging stakeholders in the planning and implementing process helped to incorporate the best possible available information, given realistic time constraints, and ensuring that the outcomes would be sustainable. The Ecological Corridor was designed to maintain connections between core habitat areas and protected areas.

Knowledge Generation and Operationalization: Studies, assessments, conservation plans, risk prevention plans and biological invasion control plans

59. The selection of the areas for which the Project would support the preparation of risk prevention plans followed guidance in the National Policy on Biodiversity, as developed by the National Program of Biodiversity, PROBIO (under the Ministry of the Environment) and the national Map of Priority Areas for Biodiversity Conservation and Sustainable Use (available at http://www.mma.gov.br/biodiversidade/projetos-sobre-abiodiveridade/projeto-deconserva%C3%A7%C3%A3o-e-tiliza%C3%A7%C3%A3osustent%C3%A1vel-da-diversidade-biol%C3%B3gica-brasileira-probio-i/%C3%A1reaspriorit%C3%A1rias).

60. The Project chose the Rapid Ecological Assessment (REA) as the methodology for the preparation of these risk prevention plans. The REA comprises the following activities: it looks across a region to understand better the ecological conditions and trends; it addresses issues related to natural and human influences on the landscape, land use conflicts and threats to biodiversity; it identifies important resource values and patterns of environmental change that may not be evident when managing smaller, local land areas; it also points out opportunities for resource conservation, restoration, and development providing baseline data to evaluate and guide future decision-making processes of landscape management. The REA carried out under of the Project followed the general guidelines established by Federal Decree No. 4.339 (which sets the principles and guidelines for the implementation of the National Policy on Biodiversity).

61. Aiming to reduce threats and adverse impacts of economic development on regional biodiversity, the restoration and conservation action plans followed two alternative approaches. As a means to promote sustainable local development, the first approach supported by the Project developed action plans that fostered integrated actions for the conservation of ecosystems in areas where the process of economic development caused

deleterious environmental impacts. The second approach supported the design of action plans aiming at the protection and conservation of threatened native flora and fauna species.

62. Aiming to provide SEMA with the knowledge basis required for prioritizing areas for interventions related to the prevention and control of invasive alien species, the Project has supported three complementary activities – namely:

- A statewide assessment of the problems caused by invasive alien species in the grasslands, in which 150 experts and researchers on this topic have been consulted;
- The identification of four priority areas for control and management of invasive alien species, and the assessment of the negative impacts and the threats represented by these species to local biodiversity; and
- The preparation of four local assessments and control plans of biological invasion in the Project's priority areas.

Education and Awareness Raising

63. Dealing with environmental education and awareness raising, the Project included the following activities:

- exhibition of plays addressing topics related to biodiversity conservation, natural resources management and environmental education, and targeting public schools' students;
- environmental education workshops and seminars targeting public schools' teachers (2013-2016);
- photographic exhibits about the Pampa Biome and its biodiversity;
- television and radio-broadcasting of materials on biodiversity conservation;
- dissemination of events and video footages through social media; and
- publication of studies and guidelines.

Institutional Capacity Strengthening for Biodiversity Conservation

64. The Project focused on providing training to technical staff, as well as equipment and durable goods for the four implementing agencies that are also the institutions in charge of environmental and biodiversity management in the state.

65. The Project also placed a strong focus on influencing policy and practice guidelines, which affect a broad number of stakeholders while costing relatively little.

Outputs

66. Component 2 outputs are considered below according to the four strategies pursued by the Project to facilitate the process of managing biodiversity and protected areas.

Consolidating protected areas

67. Component 2 contributed to the consolidation of the network of protected areas in the grasslands.

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
5. State conservation units with improved management capacity by management plans and/or infrastructure	10 (72,204 ha)	11 (223,432 ha)	Achieved (110%) (309%)

68. Eleven protected areas were supported through the existing Biodiversity Conservation State Program ("medidas compensatórias"), consolidating the protected areas in the biome. Nine of the 10 initially selected Protected Areas were supported. Two additional Protected Areas were also supported: (i) Delta do Jacuí Environmental Protection Area (*Área de Proteção Ambiental* – APA) and (ii) APA Banhado Grande. The total area supported was 223,432 ha (more than three times the originally targeted area – 72,000 ha).

Table A2.6: Supported Protected Areas and Project Supported Activities by Protected Area.

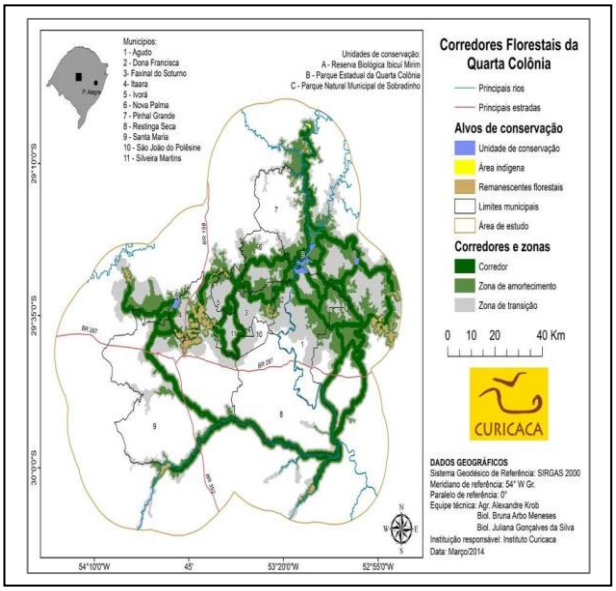
State Protected Areas	IUCN and/or national category of PA	Area (ha)	Project outputs
São Donato	Ia / Biological Reserve	13,517	Equipment
Ibirapuitã	Ia / Biological Reserve	352	Equipment
Espinilho	II / State Park	1,628	Management plan support; Environmental education activities
Podocarpus	II / State Park	3,895	Equipment
Banhado dos Pachecos	Ib / Wildlife Refuge	2,605	Equipment; Infrastructure
Itapuã	II / State Park	5,876	Review of the management plan; Equipment; Infrastructure
Quarta Colônia	II / State Park	1,847	Fencing; Equipment; Environmental education
Delta do Jacui	II / State Park	17,245	Management plan under development; Land tenure assessment; Environmental education
Mato Grande	Ia / Biological Reserve	17,245	Equipment
Delta do Jacuí	VI/ Environmental Protected Area	22,826	Equipment; Environmental education
Banhado Grande	VI/ Environmental Protected Area	136,395	Equipment
IUCN categories: Ia -Strict Natural Reserve; Ib – wilderness area; II – park; VI – protected area with sustainable use of natural resources.			

Quarta Colônia Ecological Corridor

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
9. Parcel of the area of Priority Area 1 with a conservation corridor proposed to the State Authorities	16.0%	48.3% (233.635 ha)	Achieved (302%)

69. In 2014, SEMA Ordinance No. 143 established Quarta Colônia Ecological Corridor. The total Ecological Corridor area is 233.635,39 ha, including: (i) the core zone (57,935.12 ha); (ii) the buffer zone (75,550.26 ha); and (iii) the transition zone (100,150.01 ha). The Corridor counts for 48.3 percent of the total area of the eleven municipalities within Priority Area 1 (483,743.60 ha). The Project also supported the early initiatives required for the implementation of the Quarta Colônia Ecological Corridor.

70. So far, the implementation of the Quarta Colônia Ecological Corridor has involved application of biodiversity conservation tools such as forest restoration initiatives, rural tourism, and agroforestry practices. A land use map of the core zone has been produced and institutional partnerships have been established with broad support from municipal governments to give continuity to the implementation of the corridor. FEPAM is currently enhancing the mapping of land use and vegetation cover within the Corridor.



Knowledge Generation, Dissemination and Operationalization

71. In addition to supporting the state Protected Areas system, the Project provided support to the production of knowledge on biodiversity conservation in areas of high importance for biodiversity conservation and on threatened species of the Pampa and Atlantic Forest biomes. Knowledge Generation included the support to publication and dissemination of relevant studies, papers and other publications, as well as the development and implementation of (i) risk prevention plans, (ii) biodiversity restoration and conservation plans, and (iii) alien invasive species control plans.

72. The production and publication of these studies and plans have also made a strong contribution to the institutional strengthening of the State (or Secretariat), and for the proposal and issuance of relevant regulatory frameworks concerning biodiversity conservation.

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
6. At least 6 risk prevention plans developed and under implementation	6	7	Achieved (117%)
11. Four areas with Strategies for biodiversity conservation elaborated and under implementation by the state	4	5	Achieved (125%)

Studies, Papers and Other Publications

73. The Project supported the development and dissemination of various studies on the conservation and sustainable use of biodiversity in the Rio Grande do Sul State.

74. These studies have been carried out by FZB, EMATER/RS, and EMBRAPA Clima Temperado, research centers, and scholars. They resulted in the publication of books, scientific articles and papers, guidelines, and other publications between 2011 and 2016.

75. Fifteen publications (57,000 prints) and two DVDs (3,000 copies) on the biodiversity of the Pampa Biome have been published with the support of the Project. In addition, researchers from FZB, FEPAM, and other partner institutions have participated on National and International Congresses, presenting 25 contributions/papers and summaries. Box 2 (below) lists these publications.

BOX 1

Books, Papers, and Other Publications produced from 2011 to 2016 as a result of the Project

- Avaliação Ecológica Rápida: Lagoa do Paurá; Várzea do Ibucuí; Pedra do Segredo; Várzea do Quaraí. 2016. Available at: http://www.biodiversidade.rs.gov.br/portal/index.php.
- FEPAM em Revista: Revista da Fundação Estadual de Proteção Ambiental Henrique Luís Roessler / FEPAM. – vol. 6, n.1 jan/jun 2012 – Porto Alegre.
- Natureza em Revista. Edição Especial RS Biodiversidade. Publicação Editada pela Fundação Zoobotânica do Rio Grande do Sul. 2016. Edição 14. Março, Porto Alegre. Available at: http://www.fzb.rs.gov.br/conteudo/6676/?Natureza_em_Revista_edicao_especial_RS_biodiversidade.
- Proposta de Zoneamento Ecológico Econômico – ZEE do litoral médio. Available at: http://www.biodiversidade.rs.gov.br/portal/index.php.
- Schilik, F.E.; Lima, G.R. de; Borba, A.C. L de. Manual Técnico de Pastoreio em Campo Nativo do Projeto RS Biodiversidade. Porto Alegre: Emater/RS-Ascar, 2016. 32p il.
- Borba, A.C. L de; Buttenberder, D.; Manteze, F.E; Guimaraes, L.A.; Ritter, M.F.; Kraemer, M.F. E. Manual Técnico sobre Sistemas Agroflorestais. Porto Alegre. Emater/RS-Ascar. 2016.48p. il.
- Witter, Sidia. Manual de boas práticas para o manejo e conservação de abelhas nativas (meliponíneos). 1 ed. Porto Alegre: Fundação Zoobotânica no Rio Grande do Sul, 2014. 141p. Publicação do RS Biodiversidade.
- EMBRAPA. 2015. Marlene Marche e Rosa Lia Barbieri. Editoras técnicas. Cores e Formas no bima pampa: gramíneas ornamentais nativas. 2015. 198p.
- Cactos do Rio Grande do Sul. Carneiro, M.A. Farias-Singer, R.A.R & Nilson, A.D. 2016. 224. Publicação do RS Biodiversidade.
- Os campos do Sul. Pillar, V. e Lange, Omara. Porto Alegre: Rede Campos Sulinos. UFRGS. 192 p.
- Chomenko, L. & Bencke, G.A. (organizadores). 2016. Nosso Pampa Desconhecido. Porto Alegre: Fundação Zoobotânica do Rio Grande do Sul. 2016. 208. Publicação do RS Biodiversidade.
- Barbieri, R.L. (editora técnica). Vida no butiazal. Brasília. EMBRAPA. 2015. 200p.
- *Rivas, M & Barbieri, R. Boas Práticas de Manejo para o Extrativismo Sustentável do Butiá* . Pelotas: EMBRAPA Clima Temperado, 2014, 59p. Available at: http://www.fzb.rs.gov.br/upload/20160429160121boas_praticas_de_manejo_para_o_extrativismo_sustentavel_do_butia.pdf.
- Bencke, Glayson Ariel. Lista de Referência das Aves do Rio Grande do Sul. Porto Alegre: Fundação Zoobotânica do Rio Grande do Sul, 2001. 104p. (Publicações Avulsas FZB, n.10)
- Mistura, C.C.; Barbieri, R.L.; Castro, C.M, Padulosi, S.; Alercia, A. Descriptors for on-farm conservation and use of *Butia odorata* natural population. Plan genetic Resources, Cambridge. Available at: http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=10143440&fulltextType=RA&fileId=S1479262115000040.

Risk Prevention Plans/ Threatened sites

76. At the end of Project, four Rapid Ecological Assessments (REAs) of areas of high importance for biodiversity conservation were completed and broadly disseminated. These assessments are:

- Rapid Ecological Assessment of the Várzea do Ibicuí area (Municipalities of Itaqui and Uruguaiana – Priority Area 2: Campos da Campanha);

- Rapid Ecological Assessment of the Lagoa do Paurá area (Municipality of São José do Norte – Priority Area 4: Litoral Médio);
- Rapid Ecological Assessment of the Pedra do Segredo area (Municipality of Caçapava do Sul – Priority Area 3: Escudo Sul-Riograndense);
- Rapid Ecological Assessment of the Várzea do Quaraí area (Municipalities of Barra do Quaraí, Quaraí and Uruguaiana – Priority Area 2: Campos da Campanha).

77. The findings of these assessments are available at http://www.biodiversidade.rs.gov.br/portal/index.php, and have been disseminated through the distribution of DVDs. In addition, the Project supported the preparation of a full proposal for the Ecological and Economic Zoning of the Litoral Médio region

Biodiversity Restoration and Conservation Plans

78. Seven restoration and conservation plans were implemented: (i) Butiá Palm project; (ii) Ornamental Plants project; (iii) Annoni Grass project; (iv) Pampa Grassland project; (v) Litoral Médio – Lagoa do Peixe Region project; (vi) Espinilho Park project; and (vii) Native Bees project. The rationale and outputs for the preparation and implementation of these restoration and conservation action plans are briefly described on the following matrix.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
Butiá Palm (*Butia odorata*)	Until the 1970s, large natural populations of butiá palm (*Butia odorata*) were found in the Pampa Biome, playing a fundamental role in the ecological structure, composition, landscape, and local culture. Since them, due to the cultivation of extensive monoculture crops (rice, soya, eucalyptus), overgrazing and the expansion of urban areas, the butiá palm fields have undergone a rapid decline and only a few natural areas remain. Currently, *Butia odorata* is listed as endangered in the Red list of Rio Grande do Sul Species[49].	The Project supported studies focused on: (i) the dynamics of butiazal regeneration: (ii) the mapping of remaining natural areas; (iii) fauna and flora associated with Butiá Palm fields; (iv) ecosystem regeneration and environmental services; and (v) socio-economic uses of the Butiá Palm. These studies show that sustainable management can promote the development of new plantlets of butiá, the improvement of native grassland biomass, and support livestock production. The development of these studies also recorded a new endemic flora species (*Aristida helleriana*) . Additionally, educational and awareness activities were promoted focusing on sustainable economic uses of the butiazal, the biological importance of this ecosystem and the recognition of the environmental services it provides.	The results of these studies and activities are contributing to the definition of appropriate management practices to maintain or enhance biodiversity of this critically important ecosystem. These studies are also helping to assess and monitor the status of biodiversity in the butiazal ecosystems. A proposal is under discussion for ruling the exploitation of the *Butia odorata* and EMBRAPA (in partnership with other agencies from Brazil, Argentina and Uruguay) created the "Eco-Touristic Route of Butiazais". Butiá is a long-lived and useful palm. Nevertheless, it is a neglected and subtilized species, and its genetic diversity and associated knowledge are under severe erosion. The harvest of butiá fruits is important for local economies and for the conservation of grassland ecosystems.	Natureza em Revista. Março 2016. Edição 14. Pg 8-15. Marchi, M.M., Mujica Sallés, J & Barbieri, R.L. 2015. *Aristida helleriana* (Poaceae, Aristidoideae), una nueva espécie endémica del Pampa en rio Grande do Sul, Brasil. *Novon* 24(3): 261-265. Fonseca L.X. (2012) Caracterização de frutos de butiazeiro (*Butia odorata* Barb.Rodr.) Noblick & Lorenzi e estabilidade de seus compostos bioativos na elaboração e armazenamento de geleias. Dissertation, Universidade Federal de Pelotas, Brazil 59p.

[49] State Decree 52.109 of December 01, 2014. http://www.al.rs.gov.br/filerepository/repLegis/arquivos/DEC%2052.109.pdf

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
			Well-managed plant populations can contribute to the conservation of natural resources and provide income for local population. Butiá fruits can be consumed fresh and can be used to produce jellies, ice creams, chocolates, mousses, juices and liqueurs. Butiá fruit jelly is a product with high local commercial value and requires simple equipment for preparation. The leaves are used to produce handcrafts and are an alternative source of income at the Litoral Médio region. Butiá palm fields also have a great landscape value. The fruit is a good source of iron, manganese, potassium, phenolic compounds, vitamin C and carotenoids.	
Native Ornamental Plants	Scientific studies point out the relevance and the need to promote conservation of the biological resources in the region of the Escudo Sul-rio-grandense due to its large number of threatened flora and fauna endemic species. Overexploitation and commercialization of cactus and other flora species for floral arrangements and	Assessment of the potential of native biodiversity as a driver for sustainable regional development focusing on the endemic species of cactus (mapping and population counting, assessment of the status of conservation) – many of which are classified as threatened. Knowledge generation and dissemination about these species and publication of the catalogue Colors and Forms of the Pampa Biome – Native Ornamental Plants (FZB)	The Project contributed to the conservation of native ornamental plants. Five among 30 species of cactus found in the region are commercially exploited. Four out of the five commercially exploited species are classified as endangered and vulnerable. In total, 25 out of the 30 known cactus species are classified as endangered and three of these are endemic, occurring exclusively in the studied area.	Brickell, C.D. New introductions and the use of genetic resources. *Acta Horticulturae* 552: 159-164, 2001. Barbieri, R.L.& Stumpf, E.R. *Origem e evolução de plantas cultivadas*. Brasília: Embrapa Informações. 909p., 2008. Maranhão, A. et al. O uso de plantas ornamentais nativas no Rio Grande do Sul. In. *Natureza em Revista*. Março 2016. Edição 14, p.16-25.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
	landscaping, expansion of agroforestry, livestock, mining and tourism are drivers of biodiversity loss in this still largely conserved region.			
Annoni Grass	*Eragrostis plana* (the annoni grass) was accidentally introduced in Rio Grande do Sul State in the 1950s. The introduction of the *Eragostis plana* grass, unsuitable as cattle forage, resulted in the current estimated invasion of one million hectares of natural grasslands in Rio Grande do Sul.	The Project supported field experiments to test management practices to avoid invasions of new fields, including shade practices and livestock pasture management. FEPAGRO, FEPAM and RS Federal University researchers worked together to test and disseminate on-farm practices to control and avoid additional invasions of the annoni grass.	Findings of these experiments show the increased diversity of the invertebrate fauna in areas under treatment. However, control areas show that shaded areas have a positive impact on the control of the annoni grass, but do not bring benefits on the restoration of native grasslands. Research must continue. Recording, protection and conservation of endangered native flora and fauna species.	Medeiros, R.B. and Focht, T. Invasão, prevenção, controle e utilização do capim-annoni (*Eragrostis plana* Nees) no Rio Grande do Sul, Brasil. PESQ. AGROP. GAÚCHA, PORTO ALEGRE, v.13, n.1-2, p.105-114, 2007. Medeiros, R.B, Saibro, J.C & Focht, T. Invasão do capim-annoni (*Eragrostis plana* Nees) no Rio Grande do Sul. In Pillar V. et al (eds.) 2009. *Campos Sulinos: Conservação e Uso Sustentável da Biodiversidade*. Brasília/DF: Ministério do Meio Ambiente, p. 317-330. Azevedo do Amaral, G. et al. A produção animal como opção ao controle do capim-annoni e a conservação do Pampa. In *Natureza em Revista*. Março 2016. Edição 14, p. 30-33. Azevedo do Amaral, G. et al. O sombreamento de áreas de campo como alternativa ao controle do capim-annoni e a conservação do Pampa. In *Natureza em Revista*. Março 2016. Edição 14, p. 34-37.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
Native Bees	The literature points out that agriculture expansion and its intensification throughout the Americas have been a major threat to native bees. In Rio Grande do Sul, clearance of natural habitats for cattle pasture and large-scale agriculture reduces plant and animal diversity dramatically, diminishing bee nesting and feeding opportunities and killing adult and larval bees by using agrochemicals and by ploughing the soil. In addition, agrochemical insecticides are damaging for native bees. Studies show that changes in land use in areas of intensive agriculture have led to landscape homogenization and reduced the number and diversity of pollinators. These changes have an adverse impact on the reproductive cycle of native and cultivated plants, as the decline of the pollinators	The Project supported activities for the conservation of native bees through their sustainable economic use and, consequently, fostering the conservation of natural vegetation and reducing threats to biodiversity. Complementary to the efforts carried out under Component 1, the Project supported the development and dissemination of various studies on the management techniques and benefits from native bees, including the development of a good practices guide to rural landholders based on field studies, highlighting the crucial importance of conserving wild pollinators. Among the outputs of this restoration and conservation action plan, a legal instrument was issued to regulate activities related with pollination (SEMA Normative Ruling 03/2014) and a manual of good practices for the management and conservation of native bees/wild pollinators was published and disseminated. One demonstration unit for beekeeping with native bees was established and rural producers received training (seminars and knowledge-exchange visits). The participants received the	Most plant species cultivated by man are dependent of some extent on biotic pollinators, from which bees are the most important group. About 88% of the angiosperms and 75% of the agricultural crops are highly dependent upon pollinators. In Brazil, 85% of the 141 agricultural crops rely in large degree on this environmental service to ensure productivity. Thus, agriculture and conservation of natural ecosystems have to be treated as complementary rather than opposite or incompatible themes. Raising pollinators is one of the most frequently recommended actions. Therefore, enhanced knowledge on wild pollinators' richness and diversity, raising of public and policy makers' awareness, commercial application of bee products and services, and preservation of natural habitats are important tools to promote their conservation and to contribute to mitigate the negative impacts of the cattle and crop production as well as generate income for rural producers.	Kremen,C. et al. Crop pollination from native bees at risk from agriculture intensification, *Proc. Natl. Acad. Sci, USA* 99, 16812-18816. Silveira F.A. Taxonomic constraints for the conservation and sustainable use of wild pollinators – the Brazilian wild bees, in: Kevan P.G. & Imperatriz-Fonseca, V.L. (Eds.), *Pollinating bees – the conservation link between agriculture and nature*, Brasilia, Ministry of the Environment, pp. 41–50. Vianna et al 2012 How well do we understand landscape effects on pollinators and pollination services? *Journal of Pollination Ecology* 7(5): 331-41. Alves dos Santos et al 2014 Conservação dos Polinizadores. In; Rech, A.R., Agostini, K. Oliveira, P.E. & Machado, I.C. (org.). *Biologia da Polinização*. Rio de Janeiro: Projeto, p. 493-524. Alves, D.A. 2015. A importância da paisagem agrícola no serviço de polinização das abelhas. In Associação brasileira de Estudos das Abelhas. *Agricultura e Polinizadores*, p. 32-40, available at: http://abelha.org.br/publicacoes/ebooks/Agricultura-e-Poliniacao.pdf.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
	adversely impacts floristic biodiversity and the production of foods for human consumption.	equipment and beehives (with *Tetragonisca fiebrigi* and *Scaptotrigona bipunctata*) needed for starting their units for raising wild pollinators.		Venturieri et al 2012 Meliponicultura no Brasil: situação atual e perspectivas futuras. In Imperatriz-Fonseca, V.L., Canhos, D, Alves, D.A. & Saraiva, A.M (Orgs) *Polinizadores no Brasil: contribuição e perspectivas para biodiversidade, uso sustentável, conservação e serviços ambientais*. São Paulo: Edusp, p. 213-236. Giannini et al 2015 The Dependence of Crops on Pollinators and the Economic value of Pollination in Brazil. *Journal of Economic Entomology* 108(3): 1-9. Aizen et al 2009 How much does agriculture depend on pollinators? Lessons from long term trends in crop production. *Annals of Botany* 103:1579-1588. Garibaldi et al 2013 Wild pollinators enhance fruit set of crops regardless of honeybee abundance. *Science* 6127: 1608-1611. Klein et al 2007 Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Biological Society* 274: 303-313. Ollerton, J. Winfree, R. & Tarrant, S. 2011 How many flowering plants are pollinated by animals? *Oikos* 120: 312-326. Biesmeijer et al 2006 Parallel Declines in Pollinators and Insect-Pollinated Plants in

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
				Britain and the Netherlands. *Science* 313:351-354.
Espinilho Park	The region where the Espinilho State Park is located is considered by Brazil's Ministry of the Environment as of extreme biological relevance and priority for biodiversity conservation (due mainly to a large variety of grasses endangered by anthropic activities). This region also has a huge need for the creation of new protected areas and for conservation actions targeting fauna and flora of global relevance. Several endangered endemic species are found in the region where the Espinilho State Park is located, which is also an area of high relevance for migratory species. It is the only place in the state of Rio Grande do Sul and in Brazil where	The Project supported the preparation and early implementation of a restoration and conservation action plan aimed to foster a new regional development model able to protected endangered species, taking into consideration historical, cultural and social features, and based on the perception and valorization of biodiversity and landscape. Its activities focused the buffer zone of the Espinilho State Park and addressed four thematic areas – namely: sources of environmental degradation and contamination; territorial planning aiming at environmental conservation; research, required education and capacity building activities; and potential for livelihood diversification. Compliance with the legal framework on Permanent Preservation Areas and Legal Reserves in private landholdings can play a major role for the establishment of ecological corridors connecting the Espinilho State Park to other areas of	Conservation of priority sites and endangered native flora and fauna species. Increased awareness among local stakeholders about the environmental and economic value of biodiversity. Knowledge generation on biodiversity. Consolidation of the Espinilho State Park, the only protected area in Brazil protecting savanna vegetation. Creation of an ecological corridor in the Espinilho State Park buffer zone. Protection of endangered native flora species.	Brazil Ministry of the Environment 2007 MMA Ordinance 09/2007: Áreas Prioritárias para a Biodiversidade. Available at http://www.mma.gov.br. Morsello, C. 2001 *Áreas protegidas públicas e privadas: seleção e manejo*. São Paulo: Annablume/Fapesp. Karel, J. & Mahler Jr., F 2016 O Parque Estadual do Espinilho além de seus limites: integração de aspectos ambientais, sociais e econômicos. In *Natureza em Revista*. Março 2016. Edição 14, p. 86-93.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
	records were made of the presence of *Prosopis nigra* and *Prosopis affinis*, which are endangered species of difficult regeneration. The Espinilho State Park (1,617 ha) is the only Protected Area in Brazil protecting savanna vegetation. In this context, integration of conservation with diverse land use in private landholdings has extreme relevance and protected areas must be integrated to different grassland management systems in the buffer zones.	relevant interest for biodiversity conservation and, consequently, promoting biodiversity conservation. This action plan has mapped and planed the implementation of these ecological corridors in the Espinilho State Park buffer zone. An action plan for the creation of these corridors was agreed between the stakeholders (Municipal, state and federal agencies, research institutions, environmental non-governmental organizations, labor unions, public school teachers and rural landholders from the buffer zone). The first agreed and already implemented action was the creation of the Espinilho State Park Consultative Council.		
Lagoa do Peixe Region	Although this is one of the earliest areas of human occupation in the state of Rio Grande do Sul, the potential for rational and sustainable use of natural resources in the Litoral Médio remains largely unknown. The Lagoa do Peixe National Park is known for comprising representative habitats of	The activity aimed to promote the conservation of marine, costal and riverine ecosystems in the Litoral Médio region (municipalities of Mostardas and Tavares) focusing on the buffer zone of the Lagoa do Peixe National Park. The investment comprised environmental impact assessments and the development of a proposal for a sustainable development model for this buffer zone. The Project supported the surveys of birds, mammals, amphibians	Protection of bird refuges and wetlands' fauna and flora. Consolidation of one of Brazil`s Ramsar sites.	Brazil Ministry of the Environment 2007 MMA Ordinance 09/2007: Áreas Prioritárias para a Biodiversidade. Available at http://www.mma.gov.br.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
	the costal landscape of Rio Grande do Sul and for being a refuge for more than 250 bird species (20 migratory species from North America and 10 migratory species from South America). It is classified as an important area for the conservation of birds in Brazil (Bencke et al 2006); it is also one of the twelve Ramsar sites in Brazil (Convention on Wetlands of International Importance) and it is an International Reserve of the Western Hemisphere Shorebird Reserve Network (http://www.whsrn.org/sites/list-sites).	and fishes as well as an assessment for the environmental impacts of rice fields and a social analysis of available socioeconomic data. Despite the existence of well-preserved habitats within the Lagoa do Peixe National Park, its buffer zones in the municipalities of Tavares and Mostardas, have suffered land use changes due to the major regional economic activities (rice fields, cattle ranching and *Pinus* spp plantations), which affected the region's quality as a bird refuge. In total, 135 bird species (52% of the regional avifauna) were recorded. The studies carried out under the Project show that prevailing regional economic activities have a deleterious impact on wild birds, mammals, amphibians and fishes due to the contamination of water sources by agrochemicals, land, and land-use conflicts in the buffer zone of the Lagoa do Peixe National Park. The Lagoa do Peixe National Park is one of the coastal protected areas prioritized to be supported by the new GEF Marine and Coastal Protected Areas Project (P128968).		

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
Pampa Grasslands	Grasslands play a critical role in the conservation of biodiversity, provision of genetic resources, pollination and ecosystem stabilization. For the last four centuries, livestock (mostly cattle and sheep) has been the predominant land use and economic activity on the grasslands. The composition of the fauna and flora at the Pampa has also been defined by the predominance of this productive activity. A large number of poorly known rare and endemic species are now under threat of extinction because of habitat fragmentation, soil degradation and, particularly, the introduction of invasive alien plant species. Small mammals are also good indicators of changes in the landscape and the structure of the habitat.	This action plan contributed to enhance knowledge about the biodiversity of the Pampa, the development of biodiversity conservation strategies and the sustainable management of countryside landscapes in private landholdings that have livestock as primary economic activity. The Project supported studies for the identification of potential uses of fauna and flora; identification of native species and their habitats, and pilot experiments for mitigating the threat to grassland biodiversity represented by the invasion of the annoni grass. These piloting experiments relied on the shading of invaded grassland areas and sustainable grazing management systems. The Project has also supported scientific studies on the composition and status of biological communities in areas submitted to different systems of grassland management. These studies comprised the monitoring of the countryside flora and fauna (invertebrate animals, birds and small mammals) in two different plots of land in each landholding – the first plot was fenced against the entrance of livestock, the	Findings of these experiments show the increase in diversity of the invertebrate fauna in areas under treatment. However, control areas show that shading has a positive impact on the control of the annoni, grass but do not bring about the restoration of native grasslands. Another outcome was the recording, protection and conservation of endangered native flora and fauna species. As supported by the literature, the studies show that both the absence of grazing and overgrazing of the grasslands lead to loss of floristic biodiversity in the grasslands, and that livestock is an economic activity that can be compatible with biodiversity conservation on the grassland when sustainably managed with the use of fences to rotate paddocks and to fence out more sensible and vulnerable areas. The studies on flora found large differences between the two types of plots under analysis concerning the richness of flora species, and a large number of endemic species show that grassland management positively	Pardini, R. et al 2005 The role of forest structure, fragment size and corridors in maintaining small mammals abundance and diversity in an Atlantic Forest landscape. *Biological Conservation* 124: 253-266. Umetsu, F. & Partini, R 2007 Small mammals in a mosaic of forest remnants and anthropogenic habitats – evaluating matrix quality in an Atlantic forest landscape. *Landscape Ecology* 22: 517-530. Medeiros, R.B. and Focht, T. Invasão, prevenção, controle e utilização do capim-annoni (*Eragrostis plana* Nees) no Rio Grande do Sul, Brasil. PESQ. AGROP. GAÚCHA, PORTO ALEGRE, v.13, n.1-2, p.105-114, 2007. Medeiros, R.B, Saibro, J.C & Focht, T. Invasão do capim-annoni (*Eragrostis plana* Nees) no Rio Grande do Sul. In Pillar V. et al (eds.) 2009. *Campos Sulinos: Conservação e Uso Sustentável da Biodiversidade*. Brasília/DF: Ministério do Meio Ambiente, p. 317-330. Azevedo do Amaral, G. et al. A produção animal como opção ao controle do capim-annoni e a conservação do Pampa. In *Natureza em Revista*. Março 2016. Edição 14, p. 30-33.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
		second plot was open for grazing – and in the Ibirapuitã Protected Area. They aimed to assess the impact of the exclusion of grazing on the community of floristic species, invertebrate fauna, birds, and small mammals. In addition, surveys of the mastofauna were also carried out. These studies mapped 232 plant species (146 genera belonging to 41 botanic families), 59 of which were endemic, illustrating the singularity and relevance of the flora of the Pampa biome, and 23 were identified as alien species introduced in the grasslands as fodder. One of the endemic species (*Pfaffia gnaphaloides*) is included in the official list of flora threatened with extinction in the state of Rio Grande do Sul. Data collected on birds suggest that the avifauna gradually changes when the countryside vegetation grows in height and density. These data also support the hypothesis that it is necessary to keep plots of grasslands in different succession stages and under different intensity of grazing to better accommodate a larger number of countryside birds in the landscape. The available findings finally suggest that livestock can play a relevant	contributes to the survival of species of native regional flora. With regards to the survey on invertebrate fauna, it was confirmed that structural diversity of vegetation favors greater diversity of herbivorous invertebrates and their predators.	Azevedo do Amaral, G. et al O sombreamento de áreas de campo como alternativa ao controle do capim-annoni e a conservação do Pampa. In *Natureza em Revista*. Março 2016. Edição 14, p. 34-37. Powell 2006 Effects of prescribed burns and bison (*Bos bison*) grazing on breeding bird abundances in tall grass prairies. *Auk* 123: 183-197. Derner et al 2009 Livestock as ecosystem engineers for grassland Bird habitat in the Western Great Plains of North America. *Rangeland Ecology & Management* 62: 111-118. Vélez et al 2009 Um panorama sobre as iniciativas de conservação dos Campos Sulinos. In Pillar et al (eds.) 2009 *Campos Sulinos: conservação e uso Sustentável da biodiversidade*. Brasília, Ministério do Meio Ambiente. Overbeck et al 2015 Fisionomia dos campos. In Pillar, V.P. and Lange, O. (eds) *Os Campos do Sul*. Porto Alegre: Rede Campos Sulinos/UFRGS, p. 30-41. Abruzzi de Oliveira, M.L. Flora e Vegetação. In *Natureza em Revista*. Março 2016. Edição 14, p.44-45.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
		role for the conservation of the habitats of some migratory and endangered species such as the *Anthus hellmari* and *Bartramia longicauda*.[50] In regards to small mammals, the following species have been recorded in the plots with and without grazing: *Akodon azarae*, *Oligoryzomys nigripes*, *Oligoryzomys flavescens*, *Calomys laucha* and *Holochilus brasiliensis*. Particularly relevant was the record and collection of *Reithrodon typicus*, because this species' population is among the least know among the rodents recorded in the Brazilian territory and the recent evaluation of the conservation status of fauna in the state of Rio Grande do Sul listed this species as having "Insufficient Data" . This record is of great relevance to guide new research on the population status of this rodent. The number of rodents was very low at the beginning of the experiments and grew ten times more in the plots without grazing, than in		

[50] Bencke, G.A..2016 Aves. In *Natureza em Revista*. Março 2016. Edição 14, p. 48-51. Develey, P.F. et al 2008 Conservação das aves e da biodiversidade no bioma Pampa aliada a sistemas de produção animal. *Revista Brasileira de Ornitologia* 16: 308-315. Fontana, C.S. & Bencke, G.A. 2015 Biodiversidade de aves. In Pillar, V.P. & Lange, O. (eds) *Os Campos do Sul*. Porto Alegre: Rede Campos Sulinos/UFRGS, p. 91-97.

Action Plans	Assumptions	Project Outputs	Potential Biodiversity Conservation Outcomes	Analytical Evidences/Supporting Literature
		the plots with grazing, probably due to more food availability on the first areas.[51] The findings of these studies have provided inputs for the definition of strategies and management practices able to provide a double contribution to biodiversity conservation, reducing the loss of biological characteristics of native grasslands, and ensuring the continuity of environmental services provided by this ecosystem.		

[51] Brewer, S.W. & Rejmánek M. 1999 Small rodents as significant dispersers of tree seeds in Neotropical forest. *Journal of Vegetation Science* 10: 165-174. Jardim, M. et al 2016 Mamíferos. In p. 52-55.

Invasive Alien Species Control Plans and New Regulatory Framework

79. The statewide assessment of invasive alien species resulted on the issuance of SEMA Ordinance 79/2013. This ordinance defines the list of invasive alien species for the state of Rio Grande do Sul, establishes two categories of use restriction (the species that can be used under controlled conditions and the species for which transportation, translocation, harvesting or breeding, and commercialization are forbidden), and sets norms for their control. It is the first instrument focusing on this issue in the state regulatory framework.

80. Four areas were prioritized for control and management of invasive alien species namely:

- The buffer zone of the Quarta Colônia State Park, where the control of *Hovenia dulcis* and *Acacia mearnsii* was prioritized;
- The Litoral Médio region focusing on the control of *Pinus spp*;
- The buffer zone of the Espinilho State Park focusing on early detection and rapid response to sightings of the *Axis axis* deer; and
- The Grande Island in the Casamento lagoon focusing on the control of the population growth of boars (*Sus scrofa*).

81. Subsequently, the Project supported: (a) the elaboration of four management and control plans for invasive alien species identified as critical for the prioritized areas (*Pinus spp, Axis axis* dear, *Sus scrofa, Hovenia dulcis* and *Acacia mearnsii*); and (b) the drafting of the Proposal for a State Program on Invasive Alien Species Management. This proposal comprises components related to: (i) prevention and early detection; (ii) control, eradication and monitoring; (iii) coordination and institutional integration; and (iv) research and capacity building.

82. In addition to SEMA Ordinance 79/2013, Project activities related with the control of biological invasions resulted in and supported the issuance of six normative rulings related to invasive alien flora species and two normative rulings related to fauna. These normative rulings address the process of licensing new business enterprises and are listed and described on the table below.

Table A2.7 - Normative Rulings on Biological Invasion Control.

Normative Ordinances (NO)	**Summary Description**
SEMA NO 03/2014	Establishes procedures for the creation and conservation of native bees in the state of Rio Grande do Sul
SEMA NO 04/2014	Establishes procedures and the control directives for activities involving the breeding of invasive alien fish species.
SEMA NO 05/2014	Establishes procedures and the control directives for activities involving the breeding of *Lithobates catesbeianus*.
SEMA NO 09/2014	Establishes procedures for the use and exploitation of *Acacia mearnsii*.
SEMA NO 10/2014	Establishes procedures for the execution of measures for the prevention, control and monitoring of invasive alien species as ruled by SEMA Ordinance 79/2013.
SEMA NO 11/2014	Establishes procedures for the use and exploitation of *Urochloa* spp.
SEMA NO 12/2104	Establishes procedures for the control and eradication of invasive alien plant species forbidden by SEMA Ordinance 79/2013.
SEMA NO 13/2014	Establishes procedures for the use and exploitation of *Archontophoenix cunninghamiana*.
SEMA NO 14/2014	Establishes procedures for the use and exploitation of *Pinus* spp.

Educational and Awareness Raising Events

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
10. Development of at least 40 educational and awareness events related to biodiversity aimed at 4 areas schools and specific groups, considering the local characteristics	40	60	Achieved (150%)
11. 63,000 inhabitants (40% of the rural population from the four priority areas) informed about biodiversity and its importance for conservation through environmental education	63,000	>63,000	Achieved (100%)

83. The environmental education workshops and seminars targeting state public school teachers were coordinated by a Working Group for Environmental Education instituted by an Inter-Institutional Ordinance, comprised of SEMA, FZB, FEPAM, EMATER and the State Secretariat of Education (IO 77/2012). They were carried out by a non-governmental organization (Instituto Curicaca). In total, 332 teachers from 134 public state schools were enrolled in the first stage of this activity (seven events per priority area) and 176 teachers from 46 public state schools enrolled in the second stage (16 workshops/8 hours each). Furthermore, trained teachers acted as multipliers amongst 8,800 high school students and 350 other schools' teachers and servants.[52]

84. The exhibition of theater plays reached 16 schools (four from each one of the four priority areas) and convened a total audience of 4,660 students and teachers.

85. In total, 66 educational television programs about biodiversity conservation were broadcasted by eleven regional and state television networks.[53] Furthermore, 22 radio programs on sustainable management and biodiversity were disseminated through 55 radiobroadcasting networks. Finally, 105 news pieces were disseminated through Facebook and Twitter, and educational videos were published in YouTube.[54] Up to August 26, 2016, YouTube videos, Facebook and Twitter related dissemination materials had 19,292 views.

86. The Project also supported five itinerant photographic exhibits dedicated to the Pampa Biome. These exhibits were shown at the state capital, at the municipalities in the priority areas, and outside of the country. The five exhibits featured the following

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[52] The first stage aimed at building a network of teachers of environmental education and included a baseline diagnostic on the complexity of providing environmental education in the context of each priority area. This stage also carried out three thematic workshops and one class on environmental education, totaling seven events per priority area. The second stage aimed at promoting the critical analysis and active citizen engagement on the solution of environmental threats.

[53] Namely: TVE, Rede Vida, TV Assembléia, TV UNISINOS, TV Informativo, TV FEEVALE, TV UCPEL, TV CAMPUS UFSM, UCS TV, TV UNISC, and TV Caxias.

[54] Accessible through the following links:

- https://www.youtube.com/watch?v=QxG-zMl3IVI
- https://www.youtube.com/watch?v=GZiu10bzwvc;
- https://pt-r.facebook.com/ProjetoRSBiodiversidade/posts/;
- http://www.biodiversidade.rs.gov.br/portal/index.php; https://twitter.com/ProjetoBio_RS.

themes: Life in the Butiazal ("*A Vida no Butiazal*"); Colors and Forms of the Pampa Biome: Native Ornamental Plants ("*Cores e Formas do Bioma Pampa: Plantas Nativas Ornamentais*"); Our Unknown Pampa ("*Nosso Pampa Desconhecido*"); Exploring Biodiversity ("*Explorando a Biodiversidade*"); and, Flora and Fauna in the Gaucho Tradition ("*Flora e Fauna na Tradição Gaúcha*). [55]

87. The Project Management Unit organized 24 events open to the public to disseminate the results of the Project in the state capital (Porto Alegre) and at the four priority areas. In total, 2,357 people attended these events. The list of events and number of participants are presented below.

Date	***Events***	***Local***	***Participants***
November 2015	Technical Workshop on Bird watching tourism at the Espinilho State Park region	Barra do Quaraí	23
March 2014	1st Workshop for Presentation and Discussion of the Proposal of the Quarta Colônia Ecological Corridor	Silveira Martins	79
April 2014	International Seminar on the Pampa Biome	Porto Alegre	408
May 2014	2nd Workshop for Presentation and Discussion of the Proposal of the Quarta Colônia Ecological Corridor	São João do Polêsine	55
July 2014	Pedra do Segredo Rapid Ecological Assessment Workshop	Caçapava do Sul	48
August 2014	Technical Meeting for Divulgation of the Ecological Corridor	Porto Alegre	38
August 2014	Várzea do Ibicuí Rapid Ecological Assessment Workshop	Uruguaiana	35
November 2014	Cores e Formas Bioma Pampa/Manual Abelhas Nativas & Manual Butiá Publication Event	Porto Alegre	30
December 2014	Vida no Butiazal Publication Event	Porto Alegre	40
May 2015	Second Pedra do Segredo Rapid Ecological Assessment Workshop	Caçapava do Sul	30
July 2015	Lagoa do Paurá's Rapid Ecological Assessment Workshop	Tavares	47
August 2015	Várzea do Quaraí's Rapid Ecological Assessment Workshop	Quaraí	30
October 2015	3rd Quarta Colônia Ecological Corridor Workshop	Santa Maria	92
November 2015	IX Encuentro de Ganaderos de Pastizales Naturales del Cono Sur de Sudamerica & 7º Pampa e o Gado	Santana do Livramento	450

[55] Information on the five exhibits can be found at the following webpages:

- https://www.google.com.br/?gws_rd=ssl#q=A+vida+no+butiazal;
- http://www.fzb.rs.gov.br/conteudo/4749/?MCN_sedia_exposi%C3%A7%C3%A3o_sobre_o_Bioma_Pampa);
- http://www.rs.gov.br/conteudo/141418/exposicao-fotografica-itinerante-registra-o-pampa-desconhecido/termosbusca=*);
- http://www.rs.gov.br/conteudo/127809/estado-comemora-o-ano-internacional-da-biodiversidade-com-exposicao-na-fundacao-zoobotanica/termosbusca=*);
- http://www.fzb.rs.gov.br/conteudo/925/?Aberta_a_mostra_%E2%80%9CFauna_e_Flora_na_Tradi%C3%A7%C3%A3o_Ga%C3%BAcha%E2%80%9D .

Date	*Events*	*Local*	*Participants*
November 2015	Workshop for presentation of the environmental assessment and draft proposal of the Ecological Economic Zoning of the Litoral Médio	Tapes	78
November 2015	Workshop for presentation of the environmental assessment and draft proposal of the Ecological Economic Zoning of the Litoral Médio	Mostardas	131
December 2015	Workshop for presentation of the final proposal of the Ecological Economic Zoning of the Litoral Médio	Tapes	57
December 2015	Workshop for presentation of the final proposal of the Ecological Economic Zoning of the Litoral Médio	Mostardas	104
February 2016	Event for disseminating the results of recovery actions targeting native bees and ornamental plants – Caçapava Region	Caçapava do Sul	18
February 2016	Event for disseminating the results of Butiás recovery actions – Tapes Region	Tapes	25
February 2016	Workshop for the dissemination of the outcomes of the restoration and conservation action plan for Butiás and Lagoa do Peixe	Mostardas	50
March 2016	Workshop for the dissemination of the outcomes of the restoration and conservation action plan of the Espinilho Region	Barra do Quaraí	25
March 2016	Workshop for the dissemination of the outcomes of the restoration and conservation action plan of Campo Pampa and control of *C. annoni*	Santana do Livramento	64
March 2016	Public Launching of Five Books	Porto Alegre	400

88. In addition, the Project has also commissioned and disseminated flyers, banners, educational notebooks, and other technical and communication materials.

Promoting Institutional Mechanisms / Institutional Development for Biodiversity Conservation

89. As part of Component 2, the Project focused on strengthening four governmental institutions: SEMA, EMATER/RS, FZB and FEPAM as well as on improving the regulatory framework for biodiversity conservation.

Related Intermediate Outcome Indicators	Original Project Target	Outcome at Project's closing date	Outcome Achievement Rate
12 - Four State Institutions in charge of biodiversity conservation strengthened for policy implementation	4	4	Achieved (100%)
13 - Proposal for incentives promoting biodiversity conservation opportunities	Completed	Completed	Achieved

90. Outputs of institutional-capacity building activities included technical training of human resources of the four state institutions in charge of biodiversity conservation, acquisition of equipment and durable goods to improve the operational efficiency and response capacity of these institutions, and strengthening of the legal framework concerning biodiversity conservation.

91. The Project supported the training of nine technical staff members of SEMA, FEPAM, FZB and EMATER in software required for routine geoprocessing. The training contents were developed by FEPAM's geoprocessing unit responding to the need to qualify the technical staff involved in the input of data in the Geographic Information System (SIGBIO), which was also designed and implemented with Project's support.

92. The Project also supported training and capacity building activities targeting the rural technical assistants of EMATER/RS, prioritizing the staff allocated to the municipal offices within the four priority areas of the Project. In total, 18 training events were carried out and 434 technical staff (from EMATER/RS and municipal secretariats of agriculture and environment) working at 43 municipalities were trained in topics related to biodiversity conservation and sustainable management of natural resources. The training contents were developed and ministered by a multidisciplinary and inter-institutional team comprised of representatives of state agencies (FEPAM, FZB and SEMA), partner university institutions (UFRGS, UFSM and UFPEL) and federal agencies (EMBRAPA Clima Temperado in Pelotas, EMBRAPA Pecuária Sul in Bagé and EMBRAPA Florestas in Colombo, Paraná state).

93. The Project supported the organization of the *International Seminar on the Pampa Biome: Biological, Cultural and Economic Values* in April 2014, which convened 400 participants – including experts in biodiversity conservation from Brazil, Argentina, Uruguay and Paraguay, and counting with the participation of the Brazil's Minister of the Environment and the Executive Secretary of the Convention on Biological Diversity. Assessing the biological, cultural and economic value of the biome's biodiversity, this training event aimed at consolidating ongoing policies and at agreeing on next steps for the preservation of the biome. A Manifest Letter was signed by the participating institutions, reiterating the agreement reached by the Ministries of the Environment of the Mercosul participating countries during COP 11 about the joint efforts needed for the conservation of the grasslands.[56]

94. In addition, the Project Management Unit organized 18 other events, including training seminars, workshops, technical meetings and courses, which reached 837 technical staff of SEMA, FZB and FEPAM.

[56] This document is available at http://www.sema.rs.gov.br/upload/Carta%20Pampa_PDF.pdf.
The International Seminar was registered on the following websites:
http://www.sema.rs.gov.br/conteudo.asp?cod_menu=8&cod_conteudo=8626&busca=bioma%20pampa;
http://www.sema.rs.gov.br/upload/Carta%20Pampa_PDF.pdf; and,
http://www.sema.rs.gov.br/conteudo.asp?cod_menu=4&cod_conteudo=8628&busca=bioma%20pampa.

Period	Training Events	Location	Participants
February 2013	1st Sul-rio-grandense Colloquium on conservation of wetlands	Mostardas	47
May 2013	Workshop on Economic Incentives to Conservation: concepts, challenges and opportunities	Porto Alegre	28
July 2013	SEMA Workshop on Agroforestry and Sustainable Extractive Activities	Porto Alegre	75
August 2013	Workshop on the Valuation of Environmental Services at the Quarta Colônia Region	Silveira Martins	35
June 2014	DEFAP/SEMA Course on Forest Enforcement	Porto Alegre	46
September 2014	FZB Internal Seminar on Butiá and Ornamental Plants	Porto Alegre	30
September 2014	FZB Technical Meeting	Mostardas	30
September 2014	FZB Internal seminar on the annoni grass and Pampa grasslands	Porto Alegre	37
September 2014	FZB Technical Meeting	Tapes	57
September 2014	FZB Internal Seminar on Litoral Médio, Native Bees and Espinilho	Porto Alegre	25
October 2014	FZB Technical Meeting	Santana do Livramento	30
October 2014	Protect Areas Management Course	Porto Alegre	40
November 2014	Technical Seminar on Vegetation Restoration	Porto Alegre	100
April 2015	DBIO/SEMA Technical Seminar on Licensing Procedures	Porto Alegre	74
May 2015	Protected Areas Managers Meeting	Porto Alegre	82
December 2015	Training event on administrative procedures for protected areas	Porto Alegre	28
November 2015	Course on Landscape Ecology	Porto Alegre	34
March 2016	FZB Internal Seminar for the Evaluation of Outputs of Restoration Activities	Porto Alegre	39

95. In parallel, the Project supported the acquisition of equipment (including for field activities such as live-traps, GPS and cameras), vehicles, durable goods, hardware, software and satellite images.

96. The Project also contributed successfully to the improvement of the State legal framework on themes such as ecological corridors, control of biological invasions, protection of endangered species, monitoring and evaluation and natural resources management, which resulted in the issuance of innovative regulatory instruments as listed in Box 2.

Box 2

Regulatory instruments established as result of the Project

- SEMA Ordinance N° 79, October 21, 2013. Defines the list of invasive alien species in the State of Rio Grande do Sul and establishes norms for their control. Available at: http://www.sema.rs.gov.br/upload/Portaria%20SEMA%20nº%2079_2013-%20reconhece%20a%20lista%20Espécies%20Exóticas%20Invasoras%20%20RS%20e%20demais%20classificações_normas%20de%20controle%20e%20outras%20providencias.pdf
- PSEMA Ordinance Nº 143, December 16, 2014. Defines the Quarta Colônia Ecological Corridor as an instrument for territorial management and promotion of connectivity between the Quarta Colônia State Park and other priority areas for biodiversity conservation identified in this region of the state. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14601366082014_Portaria_SEMA_n__143_Corredor_Ecologico_4__Colônia._nota_COM_MAPA.pdf
- State Decree Nº 51.882, October 3rd, 2014. Defines the Index of Conservation of Native Grasslands (Índice de Conservación del Pastizal) as an official instrument for measuring and monitoring the conservation status of native grasslands in the state of Rio Grande do Sul. Available at: http://www.al.rs.gov.br/legis/M010/M0100099.ASP?Hid_Tipo=TEXTO&Hid_TodasNormas=61414&hTexto=&Hid_IDNorma=61414
- State Decree Nº 52.096, November 27, 2014. Established the Biodiversity Monitoring System of the State of Rio Grande do Sul (RSBIOMONITORA) as the official tool for periodical evaluation of the conservation status of biodiversity in the state of Rio Grande do Sul. Available at: http://www.al.rs.gov.br/legis/M010/M0100099.ASP?Hid_Tipo=TEXTO&Hid_TodasNormas=61653&hTexto=&Hid_IDNorma=61653
- SEMA Normative Ruling Nº 03, September 29, 2014. Establishes procedures for the creation and conservation of native bees in the state of Rio Grande do Sul. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313762262014_Inst_Normat_SEMA_n__03_Criacao_Abelhas_Sem_Ferrao_RS.pdf
- SEMA Normative Ruling Nº 04, November 11, 2014. Establishes procedures and forms of control for activities involving the breeding of invasive alien fish species. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313762512014_Inst_Normat_SEMA_n__04_Estabelece_o_ordenamento_e_controle_das_atividades_que_envolvem_a_criacao_de_especies_de_peixes_exoticos_invasores..pdf
- SEMA Normative Ruling Nº 05, November 11, 2014. Establishes procedures and forms of control for activities involving the breeding of *Lithobates catesbeianus*. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313762852014_Inst_Normat_SEMA_n__05_especies_invasoras_fauna_ratouro.pdf
- SEMA Normative Ruling Nº 09, December 10, 2014. Establishes procedures for the use and exploitation of *Acacia mearnsii*. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313763222014_Inst_Normat_SEMA_n__09_estabelece_proced_uso_acacia_mearnsii_acacia_negra_enquad_categoria_2_Port_SEMA_n__79_2013_dia_12_12.pdf
- SEMA Normative Ruling Nº 10, December 10, 2014. Establishes procedures for the execution of measures for the prevention, control and monitoring of invasive alien species as ruled by SEMA Administrative Ruling 79/2013. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313763542014_Inst_Normat_SEMA_n__10_estabelece_proced_exec_medidas_prevencao_controle_monitor_ref_art_10__Port_SEMA_n__79_2013_dia_12_12.pdf
- SEMA Normative Ruling Nº 11, December 10, 2014. Establishes procedures for the use and exploitation of *Urochloa spp.* Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313764232014_Inst_Normat_SEMA_n__11_est

abelece_proced_uso_Urochloa_SPP_braquiarias_enq_Categoria_2_Port_SEMA_n__79_2013_dia_12_12.pdf

- SEMA Normative Ruling Nº 12, December 10, 2014. Establishes procedures for the control and eradication of invasive alien plant species forbidden by SEMA Administrative Ruling 79/2013. Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313764492014_Inst_Normat_SEMA_n__12_estabelece_proced_controle_e_erradicacao_esp_plantas_exot_invasoras_enq_categ_1_Port_SEMA_n__79_dia_12_12.pdf
- SEMA Normative Ruling Nº 13, December 10, 2014. Establishes procedures for the use and exploitation of *Archontophoenix cunninghamiana.* Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313764802014_Inst_Normat_SEMA_n__13_estabelece_proced_uso_Archontophoenix_Cunninghamiana_palmeira_Imperial_enq_categoria_2_Port_79_dia_12_12.pdf
- SEMA Normative Ruling Nº 14, December 10, 2014. Establishes procedures for the use and exploitation of *Pinus spp.* Available at: http://www.biodiversidade.rs.gov.br/arquivos/14313765092014_Inst_Normat_SEMA_n__14_estabelece_proced_uso_Pinus_SPP_enquad_categoria_2_Port_SEMA_n__79_2013_dia_12_12.pdf

97. In regards to the proposal for incentives to promote biodiversity conservation opportunities, the Project has two major outputs. First, the Project decisively contributed for the advancement of the Grasslands Conservation Index (Índice de Conservación del Pastizal) as an official state tool for measuring the conservation status of the grasslands. This index – under test when the ICR was prepared – is the tool to be applied when the state may concede some subsidy or incentive to rural producers engaged in state programs of grassland conservation as officially established by the State Decree 51882/2014.57. Second, the Project supported the design of a proposal for the economic valuation of environmental services for the Quarta Colônia priority area.

Assessment of Component 2 Outcomes

Consolidation of Selected Protected Areas and Proposal of an Ecological Corridor

98. In regards to the strengthening of the State System of Protected Areas, the ICR highlights that the financial execution of counterpart funds directly through the state system of compensation measures was much lower than initially envisaged. Compensatory funds' investments reached US$ 924,243.40, meaning only 32.16 percent of the planned value. Consequently, activities related to management plans, land tenure assessments, and infrastructure were not fully implemented in many targeted Protected Areas as originally envisaged.

99. Despite of that, the ICR agrees that the Project targets have been surpassed and are substantial. Eleven, rather than ten Protected Areas received support and they account for 32.4 percent of all protected areas in the State of Rio Grande do Sul. Comprising a total area of 223,432 ha, these Protected Areas equal three times the originally envisaged Project target and 30.6 percent of the area under protection in the state.

[57] http://www.al.rs.gov.br/filerepository/repLegis/arquivos/DEC%2051.882.pdf)

100. The ICR agrees that, in principle and although not officially considered a protected area under SNUC[58], the Quarta Colônia Ecological Corridor can be beneficial for biodiversity conservation and ecological restoration in the state of Rio Grande do Sul and its ongoing implementation holds broad social and political support.

Knowledge Generation and Operationalization: Studies, assessments, conservation plans, risk prevention plans and biological invasion control plans

101. The ICR concurs that the overall Project contribution for the Knowledge Generation and dissemination on the Pampa Biome was substantial. These studies demonstrate that the adoption of agricultural practices that allow the conservation of biodiversity actually contribute to increase productivity in agricultural systems, as well as to increase the income of rural producers.

102. The Rapid Ecological Assessments were used by FEPAM to set the guidelines for licensing and regularization of production activities (agroforestry, mining, rice fields, introduction of alien species, among others) in areas of high importance for biodiversity conservation.

103. As briefly described before, restoration and conservation action plans generated a large amount of relevant knowledge on biodiversity and on the impacts of socioeconomic activities on its conservation in the four priority areas – which have been selected because of their extreme importance for biodiversity conservation and occurrence of threatened ecosystems or species. The findings of studies and assessments carried out as part of these restoration and conservation action plans covered critical knowledge gaps. They have also provided inputs for the definition of strategies and management practices that effectively contribute to biodiversity conservation by reducing the loss of biological characteristics of native grasslands as well as by ensuring the continuity of environmental services provided by this ecosystem.

104. In addition, the Project advanced experimental studies for controlling and preventing biological invasions, which produced relevant knowledge and operational guidance for early detection, rapid response, effective control and management of alien invasive species. These studies led to the establishment of innovative regulatory instruments concerning biological invasions (SEMA Ordinance 73/2012 – the first element in the state legal framework to deal with this issue and eight normative rulings on invasive alien species of flora and fauna). These normative rulings have been partially incorporated by regulatory agencies and SEMA issued the Normative Rulings 4/2014, 5/2014 and 14/2014 regulating procedures for the breeding of invasive alien fishes, the breeding of *Lithobates catesbeianus*, and the use of *Pinus spp* in agroforestry enterprises, respectively. Globally, this initiative contributes to the implementation of the Convention

[58] SNUC stands for the National Protected Areas System (*Sistema Nacional de Unidades de Conservação*), established by Law No. 9985, of July 18, 2000.

on Biological Diversity (CBD) and Aichi biodiversity target 9,[59] helping to control invasive alien species.

105. The effectiveness of invasive alien species control is also related to the regulatory framework and its enforcement, and other preventing measures. The Project also contributed to disseminate the invasive species problem and, as a result, more concerned and informed citizens can participate, personally recognizing incipient invaders and preventing them from spreading. Thus, the ICR concludes that the Project substantially contributed to promote invasive alien species control, through managing practices, legal framework and environmental education activities, and made a substantial contribution to the prevention and control of invasive alien species and, consequently, protected autochthone biodiversity.

106. These knowledge generation activities promoted by the Project have also provided critical information for the database on biodiversity, vegetation cover and other socio-economic factors driving the current trends in the Pampa biome (SIGBIO and RSBIOMONITORA). Finally, they are subsidizing the preparation process of the Environmental and Economic Zoning of the State of Rio Grande do Sul, which is supported by the World Bank IPF operation Rio Grande do Sul SWAp Project (P120830).

107. This lending operation aims to strengthen and build institutional capacity of state environmental agencies (SEMA, FZB, and FEPAM) to further improve the overall state capacity to ensure environmental compliance, through two critical tools: (i) the creation of the government's Integrated Environmental Compliance Management System (SIRAM – *Sistema Integrado de Regularização Ambiental*) and the implementation of the State's Ecological-Economic Zoning. These tools will enhance the state's capacity for delivering environmental registering, licensing, and controlling services and for ensuring compliance with environmental legislation. They will enhance the state's capacity to plan land uses (including the identification of areas where particular uses may be encouraged through development policies, services and financial incentives as well areas with special needs and that require protection or conservation) and improve the state's development strategy to monitor and control productive activities, vegetation cover, logging concessions and water rights in landholdings, etc..

108. Therefore, the ICR concludes that databases, monitoring systems, studies and knowledge generated by the Project have proven very useful, and have, indeed, been fully incorporated in the design and implementation of critical tools for environmental management and policy planning by the State of Rio Grande do Sul.

Education and Awareness Raising

109. Unfortunately, given time and funding limitation, the Project was not able to evaluate the qualitative effects of education, communication and awareness activities on biodiversity conservation success. The ICR accepts the assumptions that:

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[59] https://www.cbd.int/sp/targets/#GoalB Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

- The activities carried out by the Project achieved the goal of promoting education and awareness, providing local people, special groups and regional communities with the opportunity to gain knowledge and experience on the problems surrounding the Pampa Biome;
- These activities helped local communities and special groups to acquire a set of values and skills required to identify and resolve environmental problems, and the motivation to participate in the conservation of the Pampa Biome;
- The Project has substantially contributed to the production of knowledge about the Pampa biome, which contributes for building institutional capacity and guiding policy decision-making;
- These activities contributed to broadly disseminate information and raise critical awareness on biodiversity conservation; and,
- Likewise, the Project has also contributed to the global goal of promoting education for sustainable development.

Institutional Capacity Strengthening for Biodiversity Conservation

110. The ICR also finds that the Project contributed substantially to strengthen the capacity of SEMA, FZB, and FEPAM to: (i) develop more effective strategies for biodiversity conservation; (ii) promote the sustainable use of natural resources; (iii) enforce public policies; (iv) provide quality services to landholders; and (v) monitor biodiversity conservation in the State.

111. The Project also contributed to strengthen the capacity of the State agency responsible for rural technical assistance and agricultural extension (EMATER/RS) to mainstream biodiversity conservation into the rural landscape and producers' livelihood. This goal has been achieved through the promotion of innovative agro-ecological practices for farmers within the Project's priority areas and beyond. Finally, the Project also reinforced the capacity of other governmental agencies (e.g. EMBRAPA, FETAGRO) to promote the sustainable use and conservation of biodiversity, and assisting the productive sector to adopt more sustainable development practices.

112. Although the Project supported the establishment of a strong regulatory framework, it is difficult to measure the impacts of improvements in the regulatory policy on biodiversity conservation outcomes in the short term. It is clear, however, that the Project helped to put in place relevant policies, rules and institutional competencies to deliver better quality governmental services to benefit biodiversity in the state of Rio Grande do Sul. The establishment of a public polices framework focusing on biodiversity conservation is a critical step in the right direction.

113. Overall and considering the provision of incentives, equipment, infrastructure and training, regulatory framework, and also the implementation of policy-dialogue activities, the ICR concludes that the Project's outcomes on institutional development and strengthening the regulatory framework for biodiversity conservation has exceeded the expectations and is substantial.

Annex 3 – Economic and Financial Analysis

1. *Cost-Effectiveness Analysis* – As mentioned in the PAD, it was agreed during preparation that for some Project activities estimating the real value of biodiversity conservation in monetary terms, especially when done at a larger scale and across sectors, is difficult. Any such evaluation should rely on proxies for biodiversity conservation, including the deforestation rate; soil, water, and air conservation; and changes in indicator species.

2. In addition, it was also agreed that it was not possible to determine in advance an estimated economic rate of return or internal rate of return for the Project as a whole, as doing so for those activities that have been determined would be prohibitively expensive.

3. Finally, preparation also took into account that the Project approach was focused on changes in policies that were expected to generate direct benefits to biodiversity and on increasing human capacities in sectors that have a direct impact on biodiversity as a means to create positive trends in conservation with minimal costs. In consequence, it was also agreed during preparation that it would be even more difficult and more expensive to measure the monetary value of conservation policies, which have an indirect and dispersed impact over a long period of time, than to estimate the real value of biodiversity conservation in monetary terms.

4. In consequence, during the preparation stage of the Project there was agreement that an assessment of cost-effectiveness of the proposed Project design and strategy would be the most appropriate approach.

5. Accordingly, the ICR emphasizes that the Project closed with a full level of physical and financial execution. The ratio between operational costs and substantive expenditures was similar to the one originally approved by the donor, and the lifespan of the Project only had to be extended 20 percent, compared to that originally planned. Despite initial challenges, the Rio Grande do Sul government and implementing agencies were able to deliver the agreed activities and outcomes of the Project. By and large, the design and delivery mechanism have proven to be appropriate and cost-effective to achieve the Project's results.

6. *Incremental Cost-Analysis* – Following GEF guidance, a full Incremental Cost Analysis was also carried out during preparation to assess the incremental benefit provided by the GEF grant. This analysis showed that under the "business as usual scenario" the State would implement only limited and uncoordinated interventions to mitigate environmental impacts of economic activities. The analysis also estimated that the incremental costs for achieving significant domestic and global environmental benefits equaled US$ 5 million. The accuracy of this early assessment was confirmed by Project closure. Domestic and global benefits include the reduction of deforestation and destruction of ecosystems; decreased loss of globally significant biodiversity and protection of endangered species; production and dissemination of information on biodiversity; increases in biodiversity-friendly economic processes and private sector interest in and capacity for biodiversity conservation; control and management of alien invasive species, etc.

7. *Economic and Financial Analysis* – Finally, and utilizing an extensive model measuring the Internal Rate of Return (IRR), an assessment of demonstration subprojects to be supported under Component 1 was developed during preparation. This assessment indicated that the proposed conservation practices that should be mainstreamed in the main productive systems of the grasslands would yield benefits from the viewpoint of the sustainability of natural resources and biodiversity in the project area, as well as incremental financial returns to participating farmers. These returns on farmers' investment would be larger than the opportunity costs of capital. Considering a sample of seven demonstration areas, the IRR should range from a low 4.13 percent up to 59.6 percent.

8. EMATER-RS reported preliminary results of assessments related to the adoption of "grazing systems using native pastures for beef cattle production" – the sustainable productive practice that was most broadly disseminated with the support of the Project in the grasslands. This practice was adopted by 412 rural producers (on farm subprojects, demonstration and validation units) and implemented in 94 percent of the area of private landholdings in which the Project made an intervention.

9. This preliminary assessment shows that this practice has yielded benefits related to both the sustainability of natural resources and biodiversity in the project area and significant incremental financial returns to participating farmers. At one of the Project's demonstration units of grazing systems using native pastures – a family farm located in the municipality of Caçapava do Sul – the Project supported the implementation of a grazing management area equal to 27 hectares of native pasture.

10. The grazing plan split the area into 22 paddocks and kept a stocking density equal to 3.2 animals per hectare. After the adoption of the new grazing system, the carrying capacity of these paddocks increased 46 percent and achieved live weight gains equal to 298.6 kg/ha, as well as average daily gains of live weight of steers equal to 0.536 Kg/day. Based on the current average price of live-weight steers in the state of Rio Grande do Sul (equal to Brazilian reais 5.33/Kg), this biodiversity conservation practice and production system has yielded incremental financial returns in the order of US$ 12,000 in the first year under the new grazing system (for a subproject investment lower than US$ 5,000).[60] It is worth noticing that these values reported by EMATER/RS are fully consistent with other analyses of sustainable grazing systems using native pastures found in the technical literature.[61]

11. A second sustainable production practice introduced by the Project for which positive incremental financial resources can be deduced from the literature refers to the raising of native bees. The economic benefits directly related to this practice refer mainly to the ecosystem service provided by pollination, which is essential to support the production of a wide range of crops and cannot be considered separately from the agricultural production process, and is increasingly under threat because loss of

[60] Source: EMATER-RS, http://www.emater.tche.br/site/arquivos_pdf/precos/preco_27052016.pdf

[61] Among several papers, consider: Herrero, M. et al. Livestock, livelihoods and environment: understating the trade-off. *Current Opinion on Environmental Sustainability*. 2009, 1:111-120. Reid, R.S. et all. Global Livestock impacts on Biodiversity. In: Steinfeld, H. Mooney. H., Scheneider. F. Neville (eds), *Livestocking in a changing Landscape: Drivers, Consequences, and Response*. Island. 2009.

pollinators' habitat and increased use of pesticides. Relying on the valuation methodology proposed by "the production function approach"[62], a recent assessment of the value of the pollination service for 33 crops in Brazil was estimated at US$ 6 billion according to the rate of dependency of crop production on pollination. This amount represents 27 percent of the annual value of these crops.[63]

[62] On the importance of the pollination service for agricultural production and on the production function approach as the most appropriated for valuation of this service, consider: Mburu, John et al. *Tools for Conservation and Use of Pollination Services – Economic Valuation of Pollination Services: Review of Methods*. Food and Agriculture Organization of the United Nations/Centre for Development Research, University of Bonn, 2006 (available at http://www.fao.org/fileadmin/templates/agphome/documents/Biodiversity-pollination/econvaluepoll1.pdf); Lars Hein, "The Economic Value of the Pollination Service, a Review Across Scales", The Open Ecology Journal, 2009, 2, 74-82 (available at http://www.bentham-open.com/contents/pdf/TOECOLJ/TOECOLJ-2-1-74.pdf); and, The Nature Conservancy, "Native Pollinators and Apples and Peaches: Analysis of Native Pollinator Benefits to New Jersey Farms" (available at: http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newjersey/nj-tree-fruit-fact-sheet.pdf).

[63] ABELHA (Associação Brasileira de Estudos das Abelhas), *Agricultura e Polinizadores*, São Paulo, 2015.

Annex 4 – Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Michael G. Carroll	Consultant	GENDR	Task Team leader
Maria Bernadete Ribas Lange	Environment Specialist		Task Team Leader
Simon Nicholas Milward	Junior Professional Associate	LCSEN - HIS	Team member
Dianelva Montas	Program Assistant	CASWR	
Jeannette Ramirez	Operations Officer	GEN04	Team member
Karen J. Ravenelle-Smith	Program Assistant	GGO15	Team member
Cristina Oliveira Roriz	Operations Analyst	LCSRF - HIS	Team member
Angel Alberto Yanosky	HQ Consultant ST	GENDR	
Judith Lisanky	Senior Social Specialist		Safeguard specialist
Isabella Micalli Drossos	Senior Counsel	LEGLA	Counsel
Marl Lundell	Sector Leader	LCSSD	Sector Leader
Alberto Ninio	Lead Counsel	LEGEN	Peer Reviewer
Renan Alberto Poveda	Senior Env. Specialist	LCSEN	Peer Reviewer
Dinesh Aryal	Operation Officer	LCSEN	Team member
Supervision/ICR			
Maria Bernadete Ribas Lange	Senior Environment Specialist	GEN04	Task Team Leader
Joao Vicente Novaes Campos	Financial Management Specialist	GGO22	Financial Management
Frederico Rabello T. Costa	Senior Procurement Specialist	GGO04	Procurement Management
Cristina Oliveira Roriz	Operations Analyst	LCSRF - HIS	Team Member
Eduardo Franca De Souza	Financial Management Specialist	GGO22	Financial Management
Alberto Costa	Senior Social Specialist	GSU04	ICR main author/Social and safeguard Specialist
Adriana Jose Jacques De Moraes	Team Assistance	LC5	Team Assistance
Patricia Rodrigues de Melo	Finance Analyst	WFALN	Disbursement
Daniella Ziller Arruda Karagiannis	Operations Analyst		Team Member
Wanessa Mattos	Team Assistance	LC5	Team Assistance

(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	1.54	31.51
FY06	2.80	33.40
FY07	4.94	28.14
FY08	9.64	59.17
FY09	8.61	24.27
FY10	2.18	4.59
Total:	**29.71**	**181.35**
Supervision/ICR		
FY10	1.98	4.00
FY11	4.5	18.63
FY12	2.91	10.58
FY13	5.22	16.08
FY14	4.33	31.15
FY15	20.39	61.65
FY16	8.04	25.12
FY17		24.00 (estimated)
Total:	**47.37**	**191.21**

Annex 5 – Comments On Draft ICR

1. The Implementing agencies' Completion Report, which was received by the IBRD on September 19, 2016, and is 240 pages of main text in length. A summary is provided below:

2. The Implementing Agencies' report is divided into eleven sections. The first section introduces the project and its context. The fourth and fifth sections present the Project's overall framework and financial framework.

3. The sixth section presents the interventions financed by the Project, the seventh the Project's costs and how the funds were used, and eighth the Auditing and reports' presented throughout the Project implementation.

4. The ninth section provides an overall evaluation and conclusion of the achievements as well as the lessons learned.

5. The comments provided by the SEMA on the IBRD's draft ICR are summarized below:

> We hope that the contributions identified in the draft ICR t serve as a critical reflection for the state government institutions about government's financial management, project management and biodiversity conservation.
>
> Even though already mentioned in the ICR, we would like to highlight the Project partners' commitment to the Project. As already evaluated by the Bank's team, more than 90% of the Project's indicators were fully achieved, with some suppressing the target, and 100% of the financial resources were well used; this demonstrates the coordination and commitment of the team responsible for managing the Project; their responsibility for managing well the funds available.
>
> We would like to highlight some achievements and opportunities that derived from the Project, which are:
>
> - The Secretariat delegated to the Project's PIU the task of internalizing all the actions promoted by the Project into the institution's environmental management systems.
>
> - SIGBIO was formalized through a SEMA Ordinance No 59 of May 27, 2016, to guarantee the system's continuity and availability to all potential users.
>
> - Quarta Colonia Ecological Corridor, SEMA Ordinance No 90/2016, established the Corridor's Coordination team to define the Corridor's shared management strategy.

- Espinilho Ecological Corridor. During Project implementation, one of the main obstacles to successfully promote conservation actions within this area was the reoccurrence of "abigeato". As a result, the PIU is working with the Public Security Secretariat to establish monitoring and control actions in the area to prevent "abigeato".

- Rapid Ecological Assessment. FEPAM technical staff are evaluating the products and results of the REAs to implement the actions proposed.

- Zoobotanic Fundation. The partnerships with important Project partners have been strengthened.

In order to expand the actions of the RS Biodiversity Project, the Project's PIU has been indicated as the focal point for the GEF Terrestre.

In the proposal presented to the GEF Terrestre, actions successfully implemented by the RS Biodiversity have been incorporated.

We would also like to highlight that the funds resulted from the revenue of the Project' funds will totally be reverted to biodiversity conservation actions, including the following: hiring a consultancy for the Quarta Colonia Ecological Corridor to prepare the conservation municipal plans for the 11 municipalities of the Ecological Corridor; land use mapping for 2015/2016.

We would also like to inform that during the first Pampa's International Forum and III Seminar for the Sustainability of the Campanha Region, a formal statement was released recognizing the relevance and strategic importance of the RS Biodiversity Project for the conservation and sustainable use of the Pampa Biome, requesting that the Project be continued and expanded.

With all these facts, we would like to request that the technical area of the Report should be re-evaluated to Highly Satisfactory, as we understand that based on the results presented in the Report prepared by us and the facts stated in this letter, that we have delivered a Highly Satisfactory Project.

Ofício N°009/2016 Porto Alegre, 15 de setembro de 2016.

Assunto: Análise do relatório *Implementation Completion and results report* – ICR

Prezada Sra. Bernadete Lange,

Agradecemos o envio do relatório *Implementation Completion and results report* – ICR contendo a análise do processo de concepção e implementação do Projeto RS Biodiversidade. Esperamos que as contribuições presentes no relatório estimulem uma reflexão crítica, por parte dos órgãos do governo, sobre gestão de recursos públicos, de projetos e de ações de conservação da biodiversidade.

Nosso propósito com este ofício é trazer alguns elementos provenientes da análise do ICR realizada pela UGP.

Apesar de já constar no relatório ICR, gostaríamos de destacar o comprometimento da equipe da UGP e das instituições vinculadas para o alcance das metas acordadas ao longo da implementação do Projeto. Como já avaliado pela equipe do Banco Mundial, mais de 90% das metas foram atendidas, muitas delas superadas, e realizado 100% do recurso financeiro da doação; isto demonstra a coesão do grupo responsável por administrar o projeto e sua responsabilidade pelo bem gerir o recurso público disponível.

Na oportunidade, destacamos alguns avanços e oportunidades geradas a partir do Projeto RS Biodiversidade.

Foi delegada pela gestão da SEMA, que a UGP proceda a internalização das ações do Projeto nos órgãos executores (SEMA, FZB e FEPAM), de modo a torná-las intrínsecas a gestão ambiental no Estado. Nesse primeiro momento, após implementação do Projeto, o foco das ações são:

- SIGBIO – publicada PORTARIA SEMA Nº 59, de 27 de maio de 2016, que institui o Comitê Gestor do Sistema de Informações Geográficas sobre a Biodiversidade

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- SIGBIO, tendo como escopo dar continuidade à operacionalização do Sistema por meio do acompanhamento, atualização e qualificação de seus dados, bem como sua disponibilização e divulgação para os potenciais usuários;
- Corredor Ecológico da Quarta Colônia - PORTARIA SEMA N° 90/2016: Institui Equipe Executiva Transitória e Equipe de Coordenação com objetivo de definir estratégias de implementação da gestão compartilhada do Corredor Ecológico da Quarta Colônia, neste Estado;
- Corredor Ecológico do Espinilho - ao longo da execução do trabalho constatou-se que um dos principais entraves para conservação dos últimos remanescentes da formação vegetacional Parque Espinilho é a prática recorrente do abigeato. Sendo assim, estamos somando esforços junto a Secretaria de Segurança Pública do Estado a fim de estabelecer ações de controle ao abigeato na região; espera-se que a curto prazo se estabeleça uma força tarefa a fim de coibir este crime e fortalecer a pecuária localmente, facilitando desta forma a formação dos corredores vegetacionais;
- AERs - técnicos da FEPAM estão avaliando os produtos gerados pelas Avaliações Ecológicas Rápidas e planejando ações de implementação dos planos de ação propostos para as áreas estudadas.
- Fundação Zoobotânica – Articulações com Embrapa Clima Temperado e demais parceiros, fortalecida. Ex. Parceria efetivada para definição e implementação da "Rota dos Butiazais".

Buscando ampliar as ações já implementadas pelo Projeto RS Biodiversidade foi indicada a UGP/RSBIO como ponto focal do GEF - Terrestre.

Na proposta de projeto encaminhada para o GEF - Terrestre foram incorporadas ações de manejo de campo nativo e incentivo a criação de meliponíneos em propriedades rurais do entorno das UCs a serem trabalhadas no bioma Pampa, bem como um componente dedicado a restauração de campo nativo em áreas degradadas. Nesse componente se definiu como principal ferramenta para restauração o manejo de campo nativo, em conformidade ao Manual Técnico de Pastoreio Rotativo em Campo Nativo no Projeto RS Biodiversidade.

Destacamos também que os recursos provenientes do rendimento da conta operativa do Projeto serão reinvestidos nas seguintes ações para conservação da biodiversidade:

- Corredor Ecológico da Quarta Colônia - iniciado processo de construção do termo de referência para contratação de serviço de consultoria visando a construção participativa de planos municipais da mata atlântica junto aos 11 municípios integrantes do corredor ecológico da quarta colônia/RS. Previsão inicial de investimento R$ 200.000,00;
- Mapeamento da Vegetação Uso do Solo – iniciamos a atualização do acordo de cooperação entre SEMA e UFRGS – Laboratório de Geoprocessamentos, que tem por objetivo a conjugação de esforços visando atualizar o mapeamento da vegetação do bioma Pampa ano-base 2015/2016. Com a conclusão do mapeamento teremos uma escala histórica (2002, 2009 - realizado pelo Projeto RS Biodiversidade-, e 2015/2016) de uso, perdas e ganhos de biodiversidade no bioma Pampa. Este mapeamento será integrado ao SIGBIO e ao Sistema de Monitoramento da Biodiversidade - RSBIOMonitora. Previsão inicial de investimento R$ 250.000,00;
- Por fim, para investimentos em materiais permanentes prevemos aquisições de R$ 50.000,00 visando contribuir para suprir lacunas estruturais do órgão ambiental.

Para conhecimento, encaminhamos, anexo a este ofício, moção gerada no I Congresso Internacional do Pampa e III Seminário de Sustentabilidade da Região da Campanha, reconhecendo publicamente a relevância e a importância estratégica do Projeto RS Biodiversidade para a conservação e uso sustentável do bioma Pampa e solicitando a reedição e ampliação do Projeto.

Diante deste breve relato, gostaríamos de sugerir que seja reavaliado o quesito técnico do ICR, pois entendemos que possuímos condições para conquistarmos, neste quesito, uma avaliação altamente satisfatória, considerando os argumentos e resultados constantes no relatório final do Projeto RS Biodiversidade e neste ofício.

Com votos de estima e consideração.

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Cordialmente,

Dennis Nogarolli Marques Patrocínio
Coordenador Geral
Projeto RS Biodiversidade

Ana Carolina Freitag
Coordenadora Financeira
Projeto RS Biodiversidade

Joana Braun Bassi
Coordenadora Técnica
Projeto RS Biodiversidade

Annex 6 – Comments of Cofinanciers and Other Partners/Stakeholders

Not applicable.

Annex 7 – List of Supporting Documents

Avaliação Ecológica Rápida: Lagoa do Paurá; Várzea do Ibucuí; Pedra do Segredo ; Várzea do Quaraí. 2016. http://www.biodiversidade.rs.gov.br/portal/index.php

BRASIL. Ministério do Meio Ambiente. Portaria Nº 09, de 23 de janeiro de 2007. Reconhece como áreas prioritárias para a conservação, utilização sustentável e repartição de benefícios da biodiversidade brasileira as áreas que menciona. Diário Oficial [da] República Federativa do Brasil**,** Brasília, 24 jan. 2007, p. 55.

Fepam em Revista: revista da Fundação Estadual de Proteção Ambiental Henrique Luís Roessler / FEPAM. – vol. 6, n.1 jan/jun 2012 - Porto Alegre.

Natureza em Revista. Edição Especial RS Biodiversidade. Publicação editada pela Fundação Zoobotânica do Rio Grande do Sul. 2016. Edição 14. Março, Porto Alegre. http://www.fzb.rs.gov.br/conteudo/6676/?Natureza_em_Revista_edicao_especial_RS_biodiversidade

Regulatory Documents

DECRETO Nº 47.586, de 22 de novembro de 2010. Cria a Unidade de Gerenciamento e Institui os Comitês de Acompanhamento do Projeto - 23/11/2010

PORTARIA SEMA nº 11, de 29 de março de 2011. Designação dos servidores que compõem a Unidade de Gerenciamento do Projeto - UGP - 11/04/2011

Súmulas dos Convênios SEMA-FEPAM e SEMA-FZB. Súmula do Convênio SEMA-FEPAM nº02/2011 e Súmula do Convênio SEMA-FZB nº 01/2011 - 21/02/2011

Súmulas dos Convênios SEMA-EMATER e SEMA-TNC. Súmula do Convênio SEMA-EMATER/ASCAR nº04/2011 e Súmula do Convênio SEMA-TNC nº03/2011 - 23/02/2011

PORTARIAS SEMA nº 89 e nº 90. Oficialização do Comitê Estadual e dos Comitês Locais de Acompanhamento do Projeto RS Biodiversidade

PORTARIA SEMA n° 79, de 31 de outubro de 2013. Reconhece a Lista de Espécies Exóticas Invasoras do Estado do Rio Grande do Sul e demais classificações, estabelece normas de controle e dá outras providências.

PORTARIA SEMA Nº 143, de 16 de dezembro de 2014. Reconhece o Corredor Ecológico da Quarta Colônia como instrumento de gestão territorial para promoção da conectividade entre o Parque Estadual da Quarta Colônia e demais alvos prioritários de conservação da biodiversidade identificados na região.

DECRETO nº 51.882, de 03 de outubro de 2014. Reconhece o Índice de Conservação dos Campos Nativos – ICP - Índice de Conservación del Pastizal -, como instrumento oficial para a mensuração do estado de conservação dos campos nativos do Estado do Rio Grande do Sul.

DECRETO nº 52.096, de 27 de novembro de 2014. Institui o Sistema de Monitoramento da Biodiversidade do Rio Grande do Sul - RSBIOMONITORA, como instrumento oficial

para a avaliação periódica do estado de conservação da biodiversidade no Estado do Rio grande do Sul.

INSTRUÇÃO NORMATIVA SEMA Nº 03, de 29 de setembro de 2014. Institui e normatiza a criação e conservação de meliponíneos nativos (abelhas sem ferrão), no Estado do Rio Grande do Sul.

INSTRUÇÃO NORMATIVA SEMA Nº 04, de 11 de novembro de 2014. Estabelece o ordenamento e controle das atividades que envolvem a criação de espécies de peixes exóticos invasores.

INSTRUÇÃO NORMATIVA SEMA Nº 05, de 11 de novembro de 2014. Estabelece o ordenamento e controle das atividades que envolvem a criação de *Lithobates catesbeianus* (rã touro), espécie enquadrada na Categoria 2 da Portaria SEMA nº 79/2013.

INSTRUÇÃO NORMATIVA SEMA Nº 09, de 10 de dezembro de 2014. Estabelece procedimentos para o uso da *Acacia mearnsii* (Acácia-Negra), enquadrada na categoria 2 da Portaria SEMA nº 79/2013.

INSTRUÇÃO NORMATIVA SEMA Nº 10, de 10 de dezembro de 2014. Estabelece procedimentos para a execução de medidas de prevenção, controle e monitoramento referentes ao artigo 10 da Portaria SEMA 79/2013.

INSTRUÇÃO NORMATIVA SEMA Nº 11, de 10 de dezembro de 2014. Estabelece procedimentos para o uso de *Urochloa spp.* (Braquiárias), enquadrada na categoria 2 da Portaria SEMA nº 79/2013

INSTRUÇÃO NORMATIVA SEMA Nº 12, de 10 de dezembro de 2014. Estabelece procedimentos para o controle e a erradicação de espécies de plantas exóticas invasoras na categoria 1 da Portaria SEMA nº 79/2013

INSTRUÇÃO NORMATIVA SEMA Nº 13, de 10 de dezembro de 2014. Estabelece procedimentos para o uso de *Archontophoenix cunninghamiana* (Palmeira-imperial) enquadrada na categoria 2 da Portaria SEMA nº 79/2013

INSTRUÇÃO NORMATIVA SEMA Nº 14, de 10 de dezembro de 2014. Estabelece procedimentos para o uso de *Pinus spp*., enquadrado na categoria 2 da Portaria SEMA nº 79/2013

Manual Operativo do Projeto: Conservação da Biodiversidade como Fator de Contribuição ao Desenvolvimento do Estado do Rio Grande do Sul (RS Biodiversidade) – Março de 2008

Projeto Conservação da Biodiversidade como Fator de Contribuição ao Desenvolvimento do Estado do Rio Grande do Sul - Porto Alegre/RS-Brasil - Maio 2007

Apêndice I - Relatório das Viagens e Reuniões Preparatórias das Oficinas com a Comunidade – Março e Abril de 2005

Apêndice II - Relatório do 1° Workshop de Preparação do Projeto RS Biodiversidade

Apêndice III - Relatório dos Workshops Locais de Preparação do Projeto RS Biodiversidade – Dezembro de 2005/Janeiro e Fevereiro de 2006

Apêndice IV - Relatório do 2° Workshop de Preparação do Projeto RS Biodiversidade

Apêndice V - Preparação e Implantação de Experiências e Práticas

Apêndice VI - Apoio à Utilização de Práticas para Conservação da Biodiversidade

Apêndice VII - Conservação da Biodiversidade em Áreas de Alta Importância Biológica

Apêndice VIII - Promoção e Difusão do Tema Valoração Econômica dos Serviços Ambientais Prestados pela Biodiversidade no Estado do Rio Grande do Sul

Apêndice IX - Definição de Estratégias para Influir nas Políticas Públicas de Manejo de Espécies Exóticas Invasoras

Apêndice X - Implantação de Sistema de Informação Geográfica sobre a Biodiversidade (SIGBIO)

Apêndice XI - Definição e Implantação de Sistema de Indicadores Biológicos e Socioeconômicos, a ser inserido nos Programas Institucionais de Monitoramento da Biodiversidade

Apêndice XII - Implantação de Zoneamento Ecológico-Econômico

Apêndice XIII - Estratégia de Conservação da Biodiversidade em Propriedades Privadas

Apêndice XIV - Aplicação de Instrumentos de Incentivo à Utilização de Práticas de Conservação da Biodiversidade

Apêndice XV - Sistema de Certificação de Produtos da Biodiversidade do Estado

Apêndice XVI - Elaboração de Planos de Ação

Apêndice XVII - Implementação de Ações de Recuperação

Apêndice XVIII - Educação Dirigida às Instituições de Ensino e Educação Dirigida a Grupos Específicos

Apêndice XIX - Divulgação da Biodiversidade

Apêndice XX - Capacitação de Recursos Humanos, Capacitação Institucional e Estrutura Organizacional do Projeto

Apêndice XXI - Sistema de Monitoramento e Avaliação M & A

Proposta de Zoneamento Ecológico Econômico – ZEE do litoral médio. http://www.biodiversidade.rs.gov.br/portal/index.php

Schilik, F.E.; Lima, G.R. de; Borba, A.C. L de. Manual técnico de pastoreio em campo nativo do projeto RS Biodiversidade. Porto Alegre: Emater/RS-Ascar, 2016. 32p il.

Borba, A.C. L de; Buttenberder, D.; Manteze, F.E; Guimaraes, L.A.; Ritter, M.F.; Kraemer, M.F. E. Manual técnico sobre Sistemas Agroflorestais. Porto Alegre. Emater/RS-Ascar.2016.48p. il,

Witter, Sidia. Manual de boas práticas para o manejo e conservação de abelhas nativas (meliponíneos). 1 ed. Porto Alegre: Fundação Zoobotânica no Rio Grande do Sul, 2014. 141p. Publicação do RS Biodiversidade.

EMBRAPA. 2015. Marlene Marche e Rosa Lia Barbieri. Editoras técnicas. Cores e Formas no bioma pampa: gramíneas ornamentais nativas. 2015. 198p.

Cactos do Rio Grande do Sul. Carneiro, M.A. Farias-Singer, R.A.R & Nilson, A.D. 2016. 224. Publicação do RS Biodiversidade.

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Chomenko, L. & Bencke, G.A. (organizadores). 2016. Nosso Pampa Desconhecido. Porto Alegre: Fundação Zoobotânica do Rio Grande do Sul. 2016. 208. Publicação do RS Biodiversidade.

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Bencke, Glayson Ariel. Lista de referência das aves do Rio Grande do Sul. Porto Alegre: Fundação Zoobotânica do Rio Grande do Sul, 2001. 104p. (Publicações Avulsas FZB, n.10)

Mistura, C.C. ; Barbieri, R.L.; Castro, C.M, Padulosi, S.; Alercia, A. Descriptors for on-farm conservation and use of *Butia odorata* natural population. Plan genetic Resources, Cambridge.

http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=10143440&fulltextType=RA&fileId=S1479262115000040

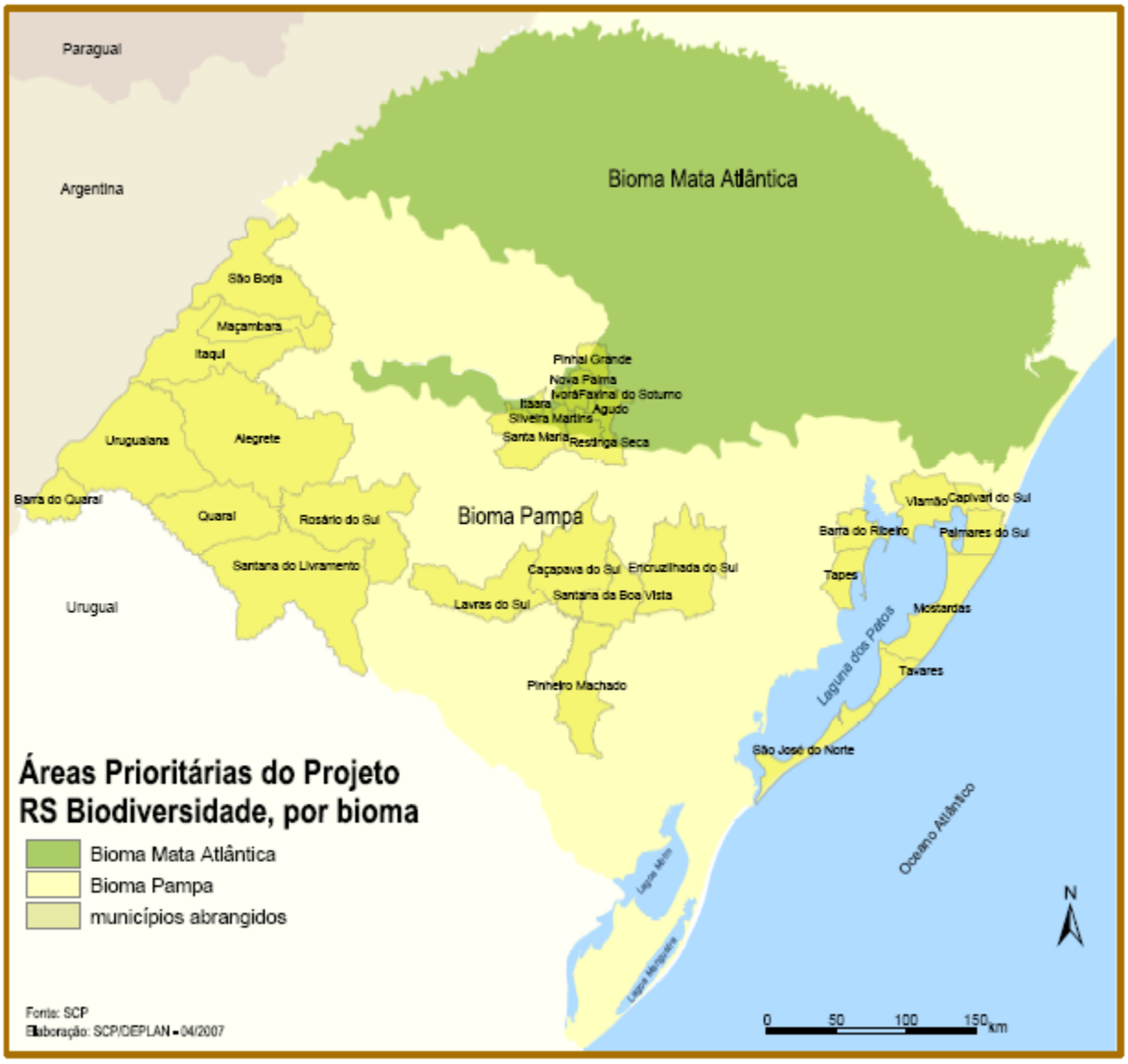
Avaliação Social

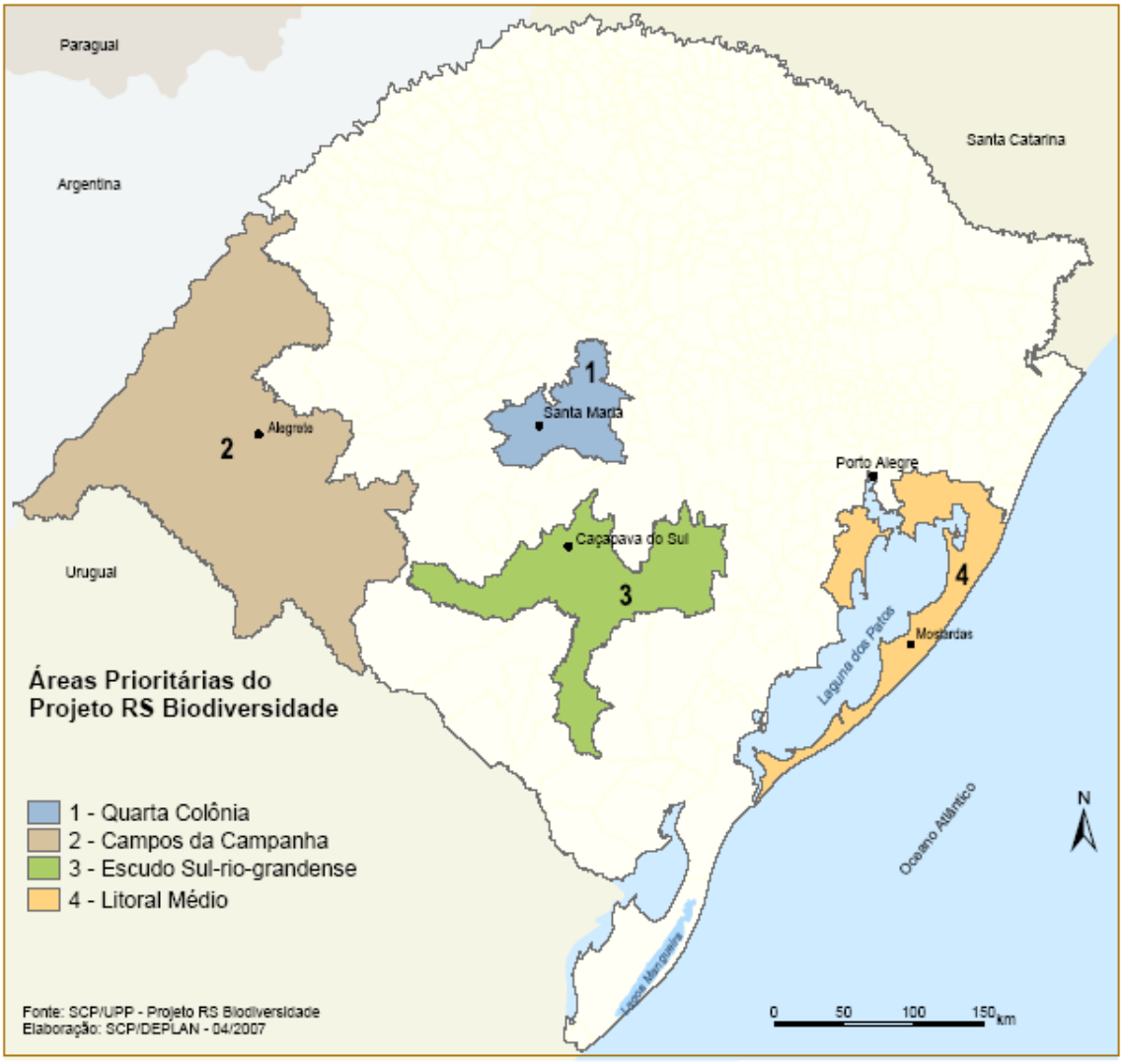
Avaliação Ambiental

Project Procurement Plans

Annex 8 – Map of Priority Areas in the State of Rio Grande do Sul

Map 1: Priority areas for biodiversity conservation in the Rio Grande do Sul State.




Paragual
Argentina
Santa Catarina
Uruguai
Alegrete
Santa Maria
Caçapava do Sul
Porto Alegre
Mostardas
Laguna dos Patos
Oceano Atlântico
Lagoa Mangueira
1
2
3
4
Áreas Prioritárias do
Projeto RS Biodiversidade
1 - Quarta Colônia
2 - Campos da Campanha
3 - Escudo Sul-rio-grandense
4 - Litoral Médio
Fonte: SCP/UPP - Projeto RS Biodiversidade
Elaboração: SCP/DEPLAN - 04/2007
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