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The World Bank

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Report No: PAD2600

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED STRATEGIC CLIMATE FUND – FOREST INVESTMENT PROGRAM GRANT

IN THE AMOUNT OF US$21 MILLION

TO THE

DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT GmbH (GIZ)

FOR A

INTEGRATED LANDSCAPE MANAGEMENT IN THE CERRADO BIOME PROJECT

IN THE FEDERATIVE REPLUBIC OF BRAZIL

September 14, 2018

Environment & Natural Resources Global Practice
Latin America and Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective July 11, 2018)

Currency Unit =		Brazilian Reais
BRL3.82 =		US$1
BRL1.00	=	US$0.26

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Jorge Familiar
Country Director:	Martin Raiser
Senior Global Practice Director:	Karin Erika Kemper
Practice Manager:	Valerie Hickey
Task Team Leaders:	Bernadete Lange, Barbara Farinelli

ABBREVIATIONS AND ACRONYMS

ABC Plan	Sectoral Plan for the Mitigation and Adaptation to Climate Change for a Low Carbon Emission Economy in Agriculture *Plano ABC–Agricultura de Baixa Emissão de Carbono*
APP	Permanent Preservation Areas *Áreas de Preservação Permanente*
ATER	Rural Technical Assistance Assistência Técnica Rural
BIP	Brazil Investment Plan
BIP-EC	Brazil Investment Plan Executive Committee
BMZ	German Federal Ministry for Economic Cooperation and Development Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung
BNDES	Brazilian National Development Bank *Banco Nacional do Desenvolvimento*
CAR	Rural Environmental Cadaster *Cadastro Ambiental Rural*
CH_4	Methane
CIF	Climate Investment Funds
CLFI	Crop, Livestock and Forest Integration System
CLI	Crop-livestock Integrated System
CNA	Brazilian Confederation of Agriculture and Livestock *Confederação da Agricultura e Pecuária do Brasil*
CO_2	Carbon dioxide
CONACER	National Commission for the Sustainable Cerrado Program *Comissão Nacional do Programa Cerrado Sustentável*
CPF	Country Partnership Framework
CRA	Environmental Reserve Quotas *Cotas de Reserva Ambiental*
DGM	Dedicated Grant Mechanism for Indigenous Peoples and Local Communities
DGP	Gross Domestic Product
EMBRAPA	Brazilian Agricultural Research Corporation *Empresa Brasileira de Pesquisa Agropecuária*
ESMF	Environmental and Social Management Framework
FAP	Forest Action Plan
FIP	Forest Investment Program
FM	Financial Management
FMA	Financial Management Assessment
GAP	Gender Action Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	German Technical Cooperation Agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GoB	Government of Brazil
GRS	Grievance Redress Service
IBGE	Brazilian Institute of Geography and Statistics

	Instituto Brasileiro de Geografia e Estatística
IBRD	International Bank for Reconstruction and Development/The World Bank
IDB	Inter-American Development Bank
IFR	Interim Financial Report
ILM	Integrated Landscape Management
INPE	National Institute for Space Research *Instituto Nacional de Pesquisas Espaciais*
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
ISA	Sustainability Indicators in Agroecosystems *Indicadores de Sustentabilidade em Agroecossistemas*
LUCF	Land Use Change and Forestry
M&E	Monitoring and Evaluation
MAPA	Ministry of Agriculture, Livestock and Food Supply *Ministério da Agricultura, Pecuária e Abastecimento*
MCTIC	Ministry of Science, Technology, Innovation and Communication *Ministério da Ciência, Tecnologia, Inovações e Comunicação*
MDB	Multilateral Development Bank
Mha	Million hectares
MMA	Ministry of Environment *Ministério do Meio Ambiente*
NDC	Nationally Determined Contribution
N_2O	Nitrous Oxide
OEMA	State Environmental Agency *Órgão Estadual do Meio Ambiente*
PCU	Project Coordination Unit *Unidade de Coordenação do Projeto*
PDF	Livestock No-tillage System *Pecuária Plantio Direto*
PDO	Project Development Objective
PEU	Project Executing Unit *Unidade de Execução do Projeto*
PNMC	National Policy on Climate Change *Política Nacional de Mudanças Climáticas*
POA	Annual Operating Plan
POM	Project Operational Manual
PPCerrado	Action Plan to Prevent and Control Deforestation and Fires in the Cerrado Biome *Plano de Ação para Prevenção e Controle do Desmatamento e das Queimadas: Cerrado*
PRA	Environmental Regularization Program *Programa de Regularização Ambiental*
PRADA	Plan to Rehabilitate Degraded Areas *Plano de Recuperação de Áreas Degradadas*
PROVEG	National Policy for the Recovery of Native Vegetation *Política Nacional de Recuperação da Vegetação Nativa*
REDD+	Reducing Emissions from Deforestation and Forest Degradation; and the role of conservation, sustainable forest management and enhancement of forest carbon stocks
RL	Legal Reserve *Reserva Legal*

SCD	Strategic Country Diagnostic
SCF	Strategic Climate Fund
SCF-FIP	Strategic Climate Fund–Forest Investment Program
SENAR	National Rural Learning Service *Serviço Nacional de Aprendizagem Rural*
SFB	*Brazilian Forest Service* *Serviço Florestal Brasileiro*
SICAR	Rural Environmental Cadaster System *Sistema Nacional de Cadastro Ambiental Rural*
SINIMA	National Environmental Information System *Sistema Nacional de Informação sobre Meio Ambiente*
tCO_{2eq}	Tons of Carbon Dioxide equivalent
TORs	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
URT	Technological Reference Unit *Unidade de Referência Tecnológica*
WBG	World Bank Group

BASIC INFORMATION

Country(ies)	Project Name	
Brazil	Integrated Landscape Management in the Cerrado Biome Project	
Project ID	**Financing Instrument**	**Environmental Assessment Category**
P164602	Investment Project Financing	B-Partial Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
31-Oct-2018	29-Dec-2023

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To strengthen the adoption of environmental conservation and restoration practices, and low-carbon emission agricultural practices in selected watersheds of Brazil’s Cerrado Biome.

Components

Component Name	Cost (US$, millions)
Institutional Development and Capacity Building for Landscape Management	2.30
Mainstreaning Landscape Practices into Selected Watersheds	15.10
Project Management, Monitoring, Evaluation and Communication	3.60

Organizations

Borrower:	Brazil - Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
Implementing Agency:	Ministry of Agriculture, Livestock, and Food Supply (MAPA) National Rural Learning Service Ministry of Environment / Brazilian Forest Service

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	21.00
Total Financing	21.00
of which IBRD/IDA	0.00
Financing Gap	0.00

DETAILS

Non-World Bank Group Financing

Trust Funds	21.00
Climate Investment Funds	21.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2019	2020	2021	2022	2023	2024
Annual	2.10	5.00	5.00	5.00	2.90	1.00
Cumulative	2.10	7.10	12.10	17.10	20.00	21.00

INSTITUTIONAL DATA

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Agriculture, Climate Change

Gender Tag

Does the project plan to undertake any of the following?	
a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF	Yes
b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment	Yes
c. Include Indicators in results framework to monitor outcomes from actions identified in (b)	Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Low
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	Substantial
7. Environment and Social	Low
8. Stakeholders	Moderate
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36	✓	
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11		✓
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12		✓
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Dated Covenants - Section I.A of Schedule 2

Project Execution Unit -GIZ

To facilitate the carrying out of the Project, the Recipient shall use the grant to establish and thereafter to maintain a Project Execution Unit (PEU-GIZ) in charge of overall Project implementation, management, monitoring and evaluation, with functions, staffing and responsibilities satisfactory to the World Bank, as set forth in the Project Operational Manual.

Sections and Description

Dated Covenants - Section I.B.1 of Schedule 2

Subsidiary Agreement

To facilitate the carrying out of the Project, the Recipient shall maintain a Subsidiary Agreement with SENAR and shall make part of the proceeds of the Grant available to SENAR under said Subsidiary Agreement, under terms and

conditions approved by the Recipient and the World Bank.

Sections and Description
Dated Covenants - Section I.C.1 of Schedule 2
Cooperation Agreement
To facilitate the carrying out of the Project, the Recipient shall maintain a Cooperation Agreement with MAPA and SFB, under terms and conditions approved by the Recipient and the World Bank.

Sections and Description
Dated Covenants - Section I.D of Schedule 2
Project Annual Operating Plan
The Recipient shall, at least once a year during Project implementation on or about December 1, commencing on the first such date after the Effective Date, prepare and furnish to the World Bank the POA, including financial management, in terms and conditions acceptable to the World Bank, for the Project's operation during the following twelve months.

Sections and Description
Dated Covenants - Section I.F.1 of Schedule 2
Project Operational Manual
The Recipient shall adopt the Project Operational Manual ("POM"), satisfactory to the World Bank, and, thereafter, carry out the Project in accordance with said manual, which shall include the rules, methods, guidelines, standard documents and procedures for the carrying out of the Project, including the following: (a) the detailed description of Project implementation activities and the detailed institutional arrangements of the Project to ensure inter-institutional coordination; (b) the Project administrative, accounting, auditing, reporting, financial management, procurement and disbursement procedures, including eligibility criteria for Recipient Costs; (c) the functions, responsibilities and composition, including the procedures to be followed by the PEU-GIZ, the PEU-SENAR, and the Project Coordination Unit; (d) the monitoring indicators for the Project; (e) a Project evaluation strategy; and (f) the Environmental and Social Management Framework ("ESMF").

Sections and Description
Dated Covenants - Section I.G.1 of Schedule 2
Safeguards
The Recipient shall carry out the Project and shall cause the Project to be carried out in accordance with the ESMF.

Sections and Description
Retroactive Financing - Section IV.B.1 of Schedule 2
Retroactive Financing
Notwithstanding the provisions of Part A of Section IV to the Grant Agreement, no withdrawal shall be made for payments made prior to the date of the Grant Agreement, except that withdrawals up to an aggregate amount not

to exceed $500,000 may be made for payments made twelve months prior to this date for Eligible Expenditures under Category (1).

Sections and Description
Dated Covenants - Section V. of Schedule 2 Mid-Term Review By July 31, 2021, or such other date as the World Bank shall agree upon, the Recipient shall: (i) carry out, jointly with the PEU-GIZ and the Project Implementing Entities, a mid-term review of the implementation of the Project, which shall cover the progress achieved in the implementation of the Project; and (ii) following such mid-term review, act promptly and diligently to take any corrective action as shall be agreed by the World Bank.

Conditions

Type	Description
Effectiveness	Section 5.01 The Grant Agreement shall not become effective until evidence satisfactory to the World Bank has been furnished that: (a) the execution and delivery of the Grant Agreement on behalf of the Recipient have been duly authorized or ratified by all necessary administrative or corporate action; (b) the Cooperation Agreement and Subsidiary Agreement have been duly signed and delivered on behalf of the Recipient and the Project Implementing Entities and have been duly authorized or ratified by all necessary administrative or corporate action; and (c) the POM has been adopted by the Recipient and the Implementing Entities in a manner and with contents acceptable to the World Bank.
Effectiveness	Section 5.02 Legal Opinion As part of the evidence to be furnished pursuant to Section 5.01 (a), there shall be furnished to the World Bank an opinion or opinions satisfactory to the World Bank of counsel acceptable to the World Bank or, if the World Bank so requests, a certificate satisfactory to the World Bank of a competent official of the Recipient, showing on behalf of the Recipient, that the Grant Agreement has been duly authorized or ratified by, and executed and delivered on its behalf and is legally binding upon it in accordance with its terms.

BRAZIL
FIP: BRAZIL INVESTMENT PLAN: INTEGRATED LANDSCAPE MANAGEMENT IN THE CERRADO BIOME PROJECT

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I. STRATEGIC CONTEXT

A. Country Context[1]

1. **After rapid growth and social progress between 2001 and 2010, Brazil's economy first stumbled and then fell into deep recession**. Sound macro policies and a favorable external environment contributed to fast economic and social progress between 2001 and 2010. However, the deterioration in both factors led to a steady decline in growth after 2010. Growth declined from an average of 3.7 percent per year between 2001 and 2010 to 2.4 percent between 2011 and 2014, followed by contractions of 3.5 percent in 2015 and 2016. While external factors triggered the slowdown, an expansionary policy response led to rapidly rising fiscal disequilibria and, with rising domestic political uncertainty, to a loss of confidence and a sharp drop in investment. The economic recovery remains weak with 1 percent growth in 2017 and 1.2 percent growth projected in 2018.

2. **The crisis threatens a decade of development progress.** Brazil experienced an unprecedented reduction in poverty and inequality when 24.8 million Brazilians escaped poverty between 2006 and 2015 and the Gini coefficient of household incomes fell from 0.59 in 1999 to 0.51 in 2015. Most of this reduction was explained by the creation of formal sector jobs, with sharp decline in the unemployment rate to a low of 6.8 percent in 2014. However, the economic crisis precipitated a rapid rise in unemployment with job losses of 0.6 million in 2015 and 2.0 million in 2016. As a result, poverty increased in 2015 and 2016. With on-going tepid economic growth poverty is estimated to have leveled off at 20.6 percent in 2017.

3. **Restoring fiscal sustainability is the most urgent economic challenge for Brazil.** To address unsustainable debt dynamics the Government of Brazil (GoB) adopted a constitutional amendment to limit public expenditure growth that entails an accumulated adjustment of 5 percentage points of GDP for the period 2019-2026 and would for stabilize debt at around 89 percent of GDP by 2026, to start declining afterwards. Implementing this fiscal adjustment requires alleviating the rigidities affecting public spending and revenue earmarking mechanisms, which turn mandatory over 90 percent of the federal government's primary spending. Also, it will require a comprehensive reform of social security to halt the projected increase in the deficit. Other measures such as controlling the wage bill of the civil service and rationalizing programs to support the private sector may be needed. Furthermore, this large fiscal disequilibrium also affects subnational governments, with limited capacity to cope with growing wage bill and pension payments unless reforms are adopted.

4. **Brazil will also need to accelerate his productivity growth and infrastructure development.** The income of an average Brazilian has risen by just 0.7 percent per year since the mid-1990s, one tenth of the rate in China and only one half of the average in OECD countries. This is mainly explained by the lack of total factor productivity (TFP) growth between 1996 and 2015. The productivity problem in Brazil is affected by absence of conducive business environment, distortions created by market fragmentation and multiple business support programs, relatively close market to external trade and competition. Also, Brazil has one of the lowest investment levels in infrastructure (2.1 percent of GDP) when compared to its peers and the quality of this investment is low. Accelerating productivity growth remains a key priority for the

[1] Sources: Brazilian Institute of Geography and Statistics [Instituto Brasileiro de Geografia e Estatística (IBGE), Ministry of Finance of Brazil, Central Bank of Brazil and World Bank.

country as the demographic transition is over and there will be limited space for public sector led growth. Reforms could focus on boosting market competition, access to external markets and cheaper inputs and technologies and simplification of the tax system. Also, higher levels of investment in infrastructure will be needed to ensure adequate maintenance of existing infrastructure stock, removing bottlenecks and expanding access to social services. This calls for improving planning capacity at government level, improving the regulatory environment and leveraging private resources to finance investments.

5. **In 2016, during the economy's retraction, the agricultural sector increased its contribution from 21.5 percent to 23 percent of the GDP.** The sector represents 48 percent of the country's total exports. Endowed with diverse landscapes and substantial natural and land resources appropriate for forest, agricultural and livestock production, the country ranks third among the world's leading agricultural exporters, fourth in food production, and second in bioethanol production. However, the current economic crisis is rekindling conflicts over land and natural resources, especially in Brazil's Amazon and Cerrado Biomes, and is highlighting the challenges the country faces in balancing the need for continued growth, the importance of the agricultural sector, and meeting international environmental commitments.

6. **Nonetheless, Brazil remains one of the world's most unequal countries, with significant areas of poverty both geographically and in terms of gender and race.** Brazil needs a different growth model to sustain past social gains. The World Bank Group's (WBG) Systematic Country Diagnostic (SCD[2]) for Brazil identified three challenges for sustaining poverty reduction and shared prosperity in the future. The first challenge is the creation of sufficient productive and well-remunerated jobs to provide employment opportunities for all working-age Brazilians. A second challenge is more efficient and better-targeted government spending. The third challenge for improved livelihoods and economic opportunities is the smarter management of Brazil's natural resources and the better mitigation of environmental pollution and the risk of natural disasters. Three principal issues in natural resource management stand out and affect the bottom 40 percent of income distribution (B40) directly and indirectly through their effects on growth and incomes: access to land and secure property rights; water management; and, more broadly, environmental management.

7. **In 2015, Brazil submitted its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC).** Brazil is committed to reducing greenhouse gas (GHG) emissions by 37 percent below 2005 levels by 2025 and, as a subsequent indicative contribution, to reducing GHGs by 43 percent below 2005 levels by 2030. The GoB is committed to its NDC's implementation, with full respect for human rights and the rights of vulnerable communities, indigenous peoples, traditional communities, and workers in sectors affected by corresponding policies and plans and is promoting gender-sensitive measures. A large part of the NDC target is based on reducing emissions from deforestation and degradation (REDD).

B. Sectoral and Institutional Context

8. **The Cerrado is a strategic biome for economic and environmental reasons as well as for food security.** It covers a large geographic area that contains significant carbon stocks and water resources, as

[2] Retaking the Path to Inclusion, Growth and Sustainability. Brazil Systematic Country Diagnostic. World Bank Group. Report N 101431-BR, May 6, 2016.

well as substantial biodiversity. This biome covers approximately 200 million hectares (ha) of the Brazilian Central Plateau (24 percent of the country's total land area). Agriculture, which occupies around 22 million ha, involves mechanized farming on large tracts of land and the widespread use of chemical inputs to correct soil acidity and enhance fertility. The Cerrado has an estimated 50 million head of cattle, nearly 33 percent of the national herd, on 54 million ha of grassland.

9. **The Brazil Investment Plan (BIP), endorsed by the Forest Investment Program (FIP) Subcommittee[3] on May 18, 2012, represents an important tool for achieving Brazil's NDC commitments in the Cerrado Biome.** The BIP seeks to promote sustainable land use and forest management improvement in the Cerrado and to contribute toward reducing pressure on the remaining forests, reducing GHG emissions, and increasing carbon dioxide (CO2) sequestration. The BIP comprises coordinated actions among three ministries: Ministry of Environment (Ministério do Meio Ambiente, MMA); Ministry of Science, Technology and Innovation (Ministério da Ciência, Tecnologia e Inovação, MCTIC); and Ministry of Agriculture and Livestock and Food Supply (Ministério da Agricultura, Pecuária e Abastecimento, MAPA).

Brazil Investment Plan				
Project: Brazil Forest Investment Plan Coordination (P152285) MDB: IBRD				
Special Window	**Theme 1: Management and Use of Already Anthropized Areas**		**Theme 2: Generation and Management of Forest Information**	**Set-aside**
Dedicated Grant Mechanism for Indigenous Peoples and Local Communities	**Project 1.1.** Environmental regularization of rural lands (P143334) MDB: IBRD	**Project 1.2.** Sustainable production in areas previously converted to agricultural use (P143184) MDB: IBRD	**Project 2.1.** Forest information to support public and private sectors in managing initiatives MDB: IDB	**Project 2.2.** Development of systems to prevent forest fires and monitor vegetation cover (P143185) MDB: IBRD
	Project: Integrated Landscape Management in the Cerrado Biome (P164602) MDB: IBRD			Private concessional funds
	Improvement of producers' access to resources available for Low Carbon Emission Agriculture		Generation and availability of spatially and temporally consistent environmental information	

10. **The BIP covers two thematic areas and includes interrelated projects. Theme 1, Management and Use of Anthropized Areas, aims to promote sustainable use on privately run farms.** Theme 2, Production and Management of Forest Information, aims to generate and make available spatially and temporally consistent environmental information for the biome. Complementary contributions to the BIP include a Dedicated Grant Mechanism for Indigenous People and Local Communities (DGM) and a private-sector window specifically designed to promote private-sector investment in Brazil. Project 1.1: Environmental Regularization (P143334) supports the rural environmental cadaster in selected municipalities. Project 1.2: Sustainable Production (P143184) aims to test and evaluate the effect of training activities and technical assistance on the adoption of low-carbon emission practices by rural producers. Project 2.1: Forest Information aims to implement the national forest inventory in the Cerrado Biome. Project 2.2: Development of systems to prevent forest fires and monitor vegetation cover f(P143185) aims to monitor vegetation-cover changes and a conceptual model for calculating GHG emissions from deforestation. The BIP also includes a BIP Coordination Project (P152285) to coordinate projects and improve the sustainability and efficiency of forest resource management and land use in the

[3] The FIP Sub-Committee is the decision-making body responsible for overseeing the operations and activities of the FIP.

Cerrado.

11. **This proposed Project is complementary to those already under implementation, which will scale up BIP results by supporting environmental regularization and low-carbon emission agricultural practices** for landholders and traditional communities in selected watersheds, promoting landscape restoration, and enhancing forest carbon stock in the Cerrado Biome's private rural landholdings.

12. **The Proposed Project also is expected to contribute to the achievement of objectives of the National Policy on Climate Change (PNMC).** The Brazil Low Carbon Agriculture Plan (ABC) is one of the sector plans stipulated by the PNMC. The program's ambitious goals include rehabilitating 15 million ha of degraded pastures and increasing the area under zero tillage from 25 million ha to 33 million hectares by 2020. The ABC Plan is focus on sustainable agriculture practices, including no-till agriculture, the restoration of degraded pasture, the planting of commercial forests, biological nitrogen fixation, treatment of animal waste, and the integration of crops, livestock and forest.

13. **The Proposed Project will also ensure that rural properties assisted by it are in environmental compliance with Brazilian Forest Code rules.** The Brazilian Forest Code (Law 12.651 of 2012) requires that all private rural landholdings maintain a percentage of native vegetation as Legal Reserves (*Reservas Legais,* RLs),[4] and that Areas of Permanent Preservation (*Áreas de Preservação Permanente,* APPs), such as riparian forests along watercourses, steep slopes, mountaintops, etc., also be maintained by landholders. The Forest Code also obliges landholders to register their landholdings in the Rural Environmental Cadaster (*Cadastro Ambiental Rural,* CAR). This registry contains details on the total area of individual farms, the areas earmarked for alternative land use, APPs and RLs.

C. Higher Level Objectives to which the Project Contributes

14. **The Proposed Project objectives and strategy are in full alignment with the Bank's twin goals of ending extreme poverty and sharing prosperity in a sustainable manner.** The Proposed Project will assist rural landowners in complying with national environmental legislation. This may lead to improvements in land-use systems and the management of natural resources on which they principally depend for their livelihoods, food security, income and quality of life; and increased job and income opportunities for landowners and other stakeholders in the value chains generated by agricultural activities.

15. **The objectives of the Proposed Project are also fully in line with the World Bank Group's Country Partnership Framework (CPF) 2018–2023 for the Federative Republic of Brazil (Report N° 113259-BR)** discussed by the Executive Directors on July 13, 2017. The Proposed Project would specifically support Focus Area 3: Inclusive and Sustainable Development, whose objective is to support the achievement of Brazil's NDC by focusing particularly on land use. As mentioned in the CPF, Brazil committed to a 43 percent reduction in GHGs by 2030 at the Paris Climate Conference in 2015. In doing so, Brazil affirmed its leadership in the international environmental agenda.

16. **The Proposed Project also supports the two focus areas identified in the Bank's Forest Action Plan (FAP) FY16–20.** Under the Focus Area: Sustainable Forestry, the Proposed Project seeks to contribute

[4] The percentage to be held as Legal Reserves varies from 80 percent in the Amazon to 35 percent in the Cerrado within the Legal Amazon, to 20 percent in the rest of Brazil.

to the recovery and sustainable management of forests and their associated value chains. Under the Focus Area: Forest-Smart Interventions, the Proposed Project fosters the adoption of integrated landscape planning, promotes agro-silvo-pastoral practices, informs decision making on land use, and builds stakeholder capacity. The Proposed Project seeks to contribute to the achievement of Brazil's goals for the reduction of GHG emissions and for climate balance, as presented in the NDC during the UNFCCC negotiations.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

17. **To strengthen the adoption of environmental conservation and restoration practices, and low-carbon emission agricultural practices in selected watersheds of Brazil's Cerrado Biome.**

B. Project Beneficiaries

18. **The Proposed Project's direct beneficiaries are the landholders living in the selected watersheds.** It is expected that 4,000 landholders will benefit from technical assistance activities. At least 25 percent of all participants are expected to be women. The Project will also provide training to enable the scale-up of low-carbon emission agricultural practices and land-restoration practices to an additional 5,200 people.

19. **The Proposed Project will consider the gender issue and encourage the participation of women in the activities and eventual generation of income and work resulting from the Proposed Project.** Some of the gender-focused activities will include gender assessments, the facilitation of women's participation in formal and informal decision-making structures and governance processes related to the equitable provision of inputs for restoration, and training for capacity strengthening to ensure effective participation in activities to be implemented through the cash-for-work scheme.

20. **Other direct beneficiaries include national and local institutions.** At the national level, the Proposed Project will strengthen and help sustain cross-sectoral collaboration among the Brazilian Forest Service (*Serviço Florestal Brasileiro,* SFB); MAPA; the National Institute for Space Research (*Instituto Nacional de Pesquisas Espaciais,* INPE), a research institution associated with MCTIC; the Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária,* EMBRAPA); and the National Rural Learning Service (*Serviço Nacional de Aprendizagem Rural*, SENAR).

C. PDO-Level Results Indicators

21. **The success of the Proposed Project interventions will be measured through the following indicators:**

- Land area where conservation and restoration practices have been adopted. (ha)
- Landholders adopting environmental conservation and restoration practices. (number, disaggregated by gender).
- Land area where low carbon emission agricultural practices have been adopted. (ha)

- Farmers adopting improved agricultural technology. (number, disaggregated by gender)

22. **These indicators are consistent with the World Bank's corporate results indicators,** the World Bank Group Forest Action Plan's core sector indicators, and the Brazil Partnership Framework FY2018–2023 progress indicators.

III. PROJECT DESCRIPTION

23. **Project Approach.** The integrated landscape management approach (ILM) will be central to this Proposed Project, in which conservation and production units within the agricultural matrix will be managed jointly for long-term sustainability. The elements of the proposed ILM are: (i) improving the implementation of the environmental regularization of rural landholdings through CAR; (ii) restoring and protecting critical habitats within private landholdings (APPs and RLs); (iii) promoting on-farm sustainable agricultural management, including the restoration of degraded pastures and the implementation of an integrated crop–livestock–forestry system; and (iv) promoting land-use planning and integrating agricultural production with biodiversity conservation. For further information on the theory of change and the Proposed Project's chain of results, see Annex 1.

24. **Project Site Selection.** The Proposed Project priority areas were defined based on multi-criteria analyses and multi-stage processes to maximize environmental and agricultural benefits. The following criteria were used to pre-select priority watersheds: (a) an Otto watershed[5] with at least 90 percent of its territory located within the Cerrado Biome; (b) density of cattle per watershed; (c) deficit of APPs and RLs in each watershed; (d) natural vegetation cover rate; (e) productive area open after 2008 (farmed area); and (f) areas of APPs deforested before July 22, 2008 (considered consolidated areas by the Forest Code Law). The potential Proposed Project area encompasses up to 53 pre-selected watersheds in nine states (Bahia, Goiás, Maranhão, Minas Gerais, Mato Grosso do Sul, Mato Grosso, Piauí, São Paulo and Tocantins). The final watershed selection will be completed during the first stage of Proposed Project implementation when the following additional criteria will be used to narrow the final list of sites: (a) number of landholders interested in adopting low-carbon emission agricultural and restoration practices; (b) local institutional capacity and engagement; (c) stakeholders' participation; (d) local infrastructure, including roads and communication facilities; and (e) landscape dynamics and functions.

A. Project Components

25. **Component 1: Institutional Development and Capacity Building for Landscape Management (Estimated Cost: US$2.3 million).** Supporting the development of capacities at the national and local levels to plan and implement a landscape approach in the selected watersheds through, inter alia: (i) land use mapping; (ii) studies and information on the Cerrado Biome; and (iii) strengthening of governance and the institutional capacity of MAPA, SFB, MCTIC/INPE, EMBRAPA, and SENAR, through consultancies, non-consulting services (e.g., rental of vehicles, maintenance, and information technology services),

[5] *http://dados.gov.br/dataset/inde_1* Otto basins are contributing areas along stretches of the hydrographic network coded according to Otto Pfafstetter's method for basin classification. Pfafstetter developed a method for numerical coding of river basins, considering as a main input the areas of direct contribution in each section of the hydrographic network. The hydrographic basins correspond to the aggregation of areas of hydrographic contribution, known as *ottobacias*.

infrastructure and civil works, the acquisition of goods and equipment, the acquisition of satellite images, the carrying out of workshops and training, and the preparation and production of communication materials.

26. **The application of the ILM approach requires thorough and careful knowledge of the action's focus area.** An understanding of land use is essential for having a strategic vision and creating scenarios for the future of the Cerrado Biome's agriculture and the conservation.

27. **Component 2: Mainstreaming Landscape Practices into Selected Watersheds (Estimated Cost: US$15,1 million).** Promoting the adoption of low-carbon emission agricultural practices and restoration practices within private landholdings and help improve production efficiency and environmental compliance through, inter alia: (i) an action plan for the selected watersheds; (ii) mobilization and engagement of producers and public environmental institutions; (iii) training; (iv) technical assistance for landholders; (v) monitoring of landholdings' performance; and (vi) support for the forest-restoration supply chain. This component introduces a new strategy for technology transfer to landholders through field technicians trained in low-carbon emission agricultural practices for the restoration of environmental liabilities and productive landholding management.

28. **This component would finance training center improvements** (renovation, reforms, and small-scale constructions), consultancies and trainers, non-consulting services, travel, technical assistance, technical supervisors and field technicians, purchase of goods and equipment, demonstration units, organization of events such as field days, and experience sharing.

29. **Component 3: Project Management, Monitoring, Evaluation and Communication (Estimated Cost: US$3.6million).** Providing support for the Proposed Project's technical and administrative management, including communication, monitoring, evaluation, reporting and auditing activities. It will finance studies, workshops, training, travel, technical advice, consulting, administrative services, limited software and equipment, and operating costs.

B. Project Cost and Financing

30. **The Proposed Project will be financed by a US$21 million Strategic Climate Fund–Forest Investment Program (SCF–FIP) grant.** The Proposed Project costs are summarized below.

Proposed Project Components	Proposed Project Cost US$	Trust Funds US$
Institutional Development and Capacity Building for Landscape Management	2,300,000	2,300,000
Mainstreaming Landscape Practices into Selected Watersheds	15,100,000	15,100,000
Project Management, Monitoring, Evaluation and Communication	3,600,000	3,600,000
Total Costs	21,000,000	21,000,000

C. Lessons Learned and Reflected in the Project Design

31. **The Proposed Project is based on the experience and lessons learned from several other projects[6] that have been implemented by Brazil and its partners**, such as the German Cooperation Land and Environmental Management Project, commissioned by the German Federal Ministry for Economic Cooperation and Development (*Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung,* BMZ), that is being implemented through GIZ; the Environmental Regulation Project for Rural Properties in the Cerrado Biome of Brazil, financed by the FIP–World Bank; Sustainable Production in Areas Previously Converted to Agricultural Use, funded by the FIP–World Bank; Development of Systems for Forest-Fire Prevention and Monitoring of Vegetation Cover in the Brazilian Cerrado Biome, also financed by the FIP–World Bank; and the Amazon Land Use Mapping and Cerrado Biome Land Use Mapping Projects, which received financial support from several partners, including the World Bank and the Brazilian National Development Bank (*Banco Nacional do Desenvolvimento*, BNDES).

32. **Specific lessons learned from these projects are that**: (a) it is essential to develop and implement spatial planning and monitoring platforms that assist governments, the private sector, non-governmental organizations (NGOs), landowners and others in planning for the prioritization and monitoring of native vegetation recovery; (b) integrated information contributes to decision making on landscape management; (c) landholders' willingness to register in CAR is as much linked to the project's credibility and positive image as to the opportunity for environmental regularization and access to credit; (d) communication investments, partnership developments, and strong, clear publicity regarding the legal and market requirements for environmental regulation are essential for awareness and engagement in the project; (e) collaboration at all levels of government and with the most influential institutions is essential for the successful implementation of CAR and the Environmental Regularization Program (*Programa de Regularização Ambiental,* PRA); (f) the engagement of public authority technicians and managers is necessary for the project's effective execution; (g) rural technical assistance (*Assistência Técnica Rural,* ATER) with technical quality and results-based management contribute to the efficient management of rural properties; (h) monitoring and evaluation (M&E) of projects allow for ongoing project execution improvement; (i) forest restoration can encourage the structuring of a productive chain that generates income and work for rural and forest producers; and (j) trained agricultural extension technicians were, and continue to be after the project closed, strong advocates for action in support of sustainable production practices and biodiversity conservation, and proved to be substantial partners.

33. **Most of these lessons have been combined successfully in the approach of the German Cooperation Project "Land and Environmental Management" in the context of the Amazon Biome.** Experiences of the German Cooperation Project serve as a reference for this Proposed Project.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

34. **The Proposed Project will be implemented by MAPA and SFB in partnership with the Deutsche**

[6] Cerrado Program's projects: P143376 - Rural Environmental Cadastre in Bahia; P143362 - Rural Environmental Cadastre in Piaui; P145822 - NLTA DEFRA CERRADO Climate Change; P150892 - ProCerrado Federal; and P149189 - Platform of Monitoring and Warning of Forest Fires in the Cerrado; BIP's projects: P143334 - FIP: Environmental regularization of rural lands in the Cerrado of Brazil; P143185 - Development of systems to prevent forest fires and monitor vegetation cover in the Brazilian Cerrado; and P143184 - Sustainable Prod. in Areas Previously Converted to Agricultural Use.

Gesellschaft für Internationale Zusammenarbeit (GIZ) and SENAR. MAPA and SFB have the overarching policy-level responsibility for carrying out the overall institutional coordination required to implement the proposed Project activities. The Brazil Investment Plan Executive Committee (BIPEC) has appointed GIZ to manage grant resources.

35. **To this end, GIZ will sign a grant agreement with the World Bank to carry out the proposed Project implementation.** The grant agreement will set forth the specific terms and agreements for grant management and include the following responsibilities: procuring goods and contracting services needed for the proposed Project execution with grant resources; carrying out disbursements and the financial execution and accounting of the Proposed Project; and providing technical support to carry out the proposed Project activities.

36. **A Subsidiary Agreement will be signed by GIZ and SENAR on activities to promote low-carbon agricultural practices (Component 2).** A Cooperation Agreement will be signed by GIZ, MAPA and SFB on the proposed Project management activities. Technical Cooperation Agreements would be signed, as appropriate, by GIZ, MAPA, SFB, SENAR, MCTIC/INPE (a research institution associated with MCTIC), and EMBRAPA on landscape monitoring, training, technical assistance and other landscape management activities.

37. **The Proposed Project has developed a management arrangement to ensure synergies among the different implementing entities during the implementation phase.**

- **Project Coordination Unit (PCU).** The PCU, which is the lead by SFB, will comprise representatives from SFB, MAPA and GIZ. The PCU will be responsible for coordinating the proposed Project implementation; technically supervising the development of the proposed Project activities, including effective coordination of research and development activities at the proposed Project level; coordinating the proposed Project's different actors; and monitoring and evaluating the Proposed Project. This unit will be the Bank's main liaison during the proposed Project implementation. It will compile all Project-related information provided by the implementing entities and institutional partners, and will produce technical and safeguard reports as required by World Bank policies. The unit will be headed by a Project coordinator and supported by technical specialists and administrative staff.
- **Project Executing Units (PEUs)**. Two PEUs will be established: one in GIZ (PEU–GIZ) and the other in SENAR (PEU–SENAR). Each PEU will have dedicated personnel to ensure the planning and budgeting of the proposed Project activities, financial management (FM) and procurement. The PEU–GIZ will be responsible for overall technical supervision and quality control, gender and social inclusion, environmental and social safeguards compliance, and M&E.
- **Institutional Partners**. MCTIC/INPE and EMBRAPA will be involved in the mapping of land clearing and land-use changes in the Cerrado Biome and selected watersheds and in capacity-building and training activities. The institutional partners will also provide technical advice on the overall implementation strategy and changes to it. Specific Technical Working Groups will be established to analyze and provide technical guidance on issues that may arise concerning implementation.

B. Results Monitoring and Evaluation

38. **The proposed Project adopts a multi-scale M&E approach, i.e., at watershed and landholding**

scales. The selection of indicators was designed to reflect the landscape approach within landholding activities, conservation objectives, as well as stakeholders' participation. In addition, the use of corporate core indicators, Forest Action Plan (FAP) performance indicators, and Brazil CPF progress indicators will allow the results and impacts to be aggregated at BIP, FIP and World Bank Group corporate levels. The monitoring of the proposed Project outputs will be conducted in partnership with the various implementing entities. The proposed Project execution and results monitoring will use the reports of systems that are already in use, such as the Rural Environmental Cadaster System *(Sistema Nacional de Cadastro Ambiental Rural,* SICAR), Sustainability Indicators in Agroecosystems (*Indicadores de Sustentabilidade em Agroecossistemas*, ISA), TerraClass and others.

39. **GIZ, with the support of the PCU, will be responsible for monitoring the progress of the proposed Project's results and impacts.** GIZ will develop and make available an electronic system for monitoring and evaluating the proposed Project execution. This monitoring approach will be complementary to the commissioned arrangement with the German Cooperation Project "Land and Environmental Management." The proposed Project's M&E includes PDO and intermediate results indicators to monitor implementation progress. See Section VII: Results Framework and Monitoring for further information. The proposed Project progress reports will be submitted to the World Bank twice a year. The proposed Project M&E will be conducted in accordance with BIP M&E and established FIP rules and procedures. The BIP–EC will also oversee the communication of monitored information and provide inputs to the BIP M&E system.

C. Sustainability

40. **Overall, the proposed Project will help MAPA and SFB to implement the Low-Carbon Emission Agricultural Plan and the Forest Code**, which are priorities for the Federal Government. The proposed Project sustainability will be found in the long-term financial and non-financial benefits that will be achieved as a result of activities that the proposed Project will implement in selected watersheds:

- Producers' involvement will contribute to the sustainability of investments that are mutually beneficial to them and the government agencies. Environmental compliance certification will incentivize farmers'/landowners' interest in investing in the medium- to long-term productivity of their landholdings.
- Producers' application of sustainable practices and best practices for soil use and management on their rural properties will enable ILM and the reconciliation of agriculture and livestock raising with ecosystem conservation in the Cerrado Biome.
- The use of Rural Technical Assistance (ATER) with quality- and results-based management will increase producers' access to credit for simultaneously increasing agricultural production and forest restoration.
- Improvement and expansion of natural vegetation will ensure long-term provision of ecosystem services (generating local, national and global environmental benefits) that come from such areas.
- The structuring of forest-restoration productive chains in the region will provide financial autonomy to rural producers who supply raw materials (seeds, seedlings, planting and maintenance services).

D. Role of Partners

41. **Although several agencies and institutions will participate in the proposed Project implementation, SFB and MAPA will conduct overall coordination.** The POM will detail the roles and responsibilities of each agency involved in the proposed Project implementation:

- MAPA and SFB will play a leadership role in Project coordination. They will also provide overall strategic advice and support on the Low-Carbon Emission Agricultural Plan's implementation.
- GIZ will be the grant recipient. It will have fiduciary responsibility for the proposed Project, including day-to-day FM operations, budget execution and transaction processing. In addition, GIZ will work closely with SFB on all activities related to CAR and environmental and restoration practices.
- As one of the implementing entities, SENAR will be responsible for overall rural extension activities and direct relationships with farmers' and producers' organizations. Its Project management team will include a general manager, a technical manager, an administrative manager and support staff, as well as ad hoc advisory services for management and specialized services.
- MCTIC/INPE and EMBRAPA will be involved in the mapping of land clearing and land-use changes in the Cerrado Biome and selected watersheds, and in the preparation of technical material for the training courses.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

42. **The overall risk rating for the proposed Project is Substantial.** Key factors underlying this rating are related to the issues highlighted in the following paragraphs.

43. **Political and Governance Risk is rated Substantial.** Governance risk is related to the significant number of implementing entities, which generates challenging coordination efforts to guarantee that processes and activities run smoothly. To mitigate this risk, each institution has designated public servants as key personnel involved and in charge of the proposed Project, and they will, most likely, not rotate to other institutions or to other areas within their institution. Continuity of the proposed activities is foreseeable, even in the event of political changes, because the proposed Project focuses on the implementation of policies, and national and international commitments such as the NDC, and has a strong focus on private landholdings and productivity.

44. **Macroeconomic Risks are rated Moderate.** Brazil's current macroeconomic situation could potentially impact the government implementing entities' funding due to the potential decreased budget to federal and state agencies. This risk is mitigated because the Grant Agreement will be signed with a non-Brazilian-government institutions (GIZ), avoiding the funds to go through the GoB's national budget. Hence, the fiscal constraints of the GoB will not be a restriction to the proposed Project's funds.

45. **Technical Design of the proposed Project Risk is rated Moderate.** The main technical issues are associated with the fact that good ILM requires coordination of multiple institutional partners, policies and a participatory process, to guarantee that all parties involved are undertaking their activities as planned. To mitigate this risk, the proposed Project design includes activities to strengthen the capacity of stakeholders and enhance landscape monitoring capacity. The existing legal framework and government commitment are also mitigating factors.

46. **Institutional Capacity for Implementation and Sustainability Risks are rated Moderate.** There is a risk that the proposed Project implementation may be affected by the lack of experience of the implementing agencies with Bank procedures, mainly GIZ. To mitigate the risk, the proposed Project will support capacity building events for staff of the implementing entities on Bank fiduciary and safeguard procedures. Sustainability is also rated moderate due to the need to guarantee that all implementing institutions incorporate the knowledge acquired during the proposed Project implementation and continue to implement activities once the proposed Project closes, considering that the proposed Project's interventions are based on National Policies, the proposed Project needs to guarantee technical arrangements that can be maintained and support the policies.

47. **Stakeholder Participation Risk is rated Moderate.** Strong stakeholder participation is key both to the successful adoption of conservation and agricultural practices as well as to the implementation of an integrated landscape approach. This is challenging and requires well-prepared and coordinated out-reach campaigns; to mitigate the risk of low stakeholder engagement, the proposed Project will actively involve a wide range and number of landholders through training activities, communication campaigns and mobilization activities, rural extension and services; and actively promote dialogue among productive associations and local leaders.

48. **Fiduciary Risk is rated Substantial.** Overall, the procurement risk Phas been assessed as Substantial, due to GIZ's lack of experience with Bank's procurement rules. The residual FM risk associated with the proposed Project is rated as Substantial, due to GIZ's limited experience with Bank-financed-projects and FM procedures, and the close coordination that will be required between GIZ and SENAR.

49. **Environmental and Social Risks are rated Low.** The proposed Project is expected to have an overall positive impact on the environment because it seeks to promote the protection of APPs and RLs, reforestation, recovery of degraded pastures, and reduction in the environmental impacts of agricultural activities mainly through rural extension activities.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

50. **Approach.** Financial and macroeconomic assessments were carried out to estimate the cash flow and price sensitivity for low-carbon emission agricultural practices and forest recovery, as well as the proposed Project's macroeconomic viability through shadow prices and value of potential CO_2 captured. For the financial evaluation, the projections had multi-year investments, including the first-year Project costs, using an annual interest rate of 7.5 percent. The same applied for the credit line of the BNDES–ABC Plan, assuming an average farm size of 1,000 ha with 200 ha of RL that can be restored and 800 ha of agricultural and/or livestock production. Two scenarios were considered (Scenario 1: 100 percent investment;[7] Scenario 2: partial investment[8]), and technical production assumptions were made for four different activity levels expected to be implemented by farmers after the proposed Project interventions:

[7] Landowners are starting investments from zero.
[8] Landowners already have production established and are making partial investments.

Level I: conventional livestock pasture systems, grazing soils with high level of degradation; Level II: adoption of no-tillage system; Level III: adoption of integrated crop–livestock integrated system (CLI); and Level IV: adoption of crop, livestock and forest integration system (CLFI). Two technical scenarios were considered for the RL recovery projections: mechanized and not mechanized. For the macroeconomic analysis, the private and social projections used an annual discounted rate of 10 percent, as well as shadow prices, value of potential CO_2 capture, option value plus existence value, and hedonic pricing.

51. **Findings.** For the financial analysis, the results of the different activity levels used specific premises and should not be extrapolated to particular cases. All projections are characterized by consistently positive cumulative cash flow. In most cases, cattle producers will find it difficult to implement the CLI 4 areas–Livestock No-tillage System *(Pecuária Plantio Direto,* PDF)[9] because they will require greater managerial and technological capacity to absorb the risk associated with annual crops. The average cattle producer in Brazil would migrate to the CLI 3 areas–PDF model, planting corn or sorghum which would require fewer technological needs. For all the projections, the expenditures for the recovery of RLs had little impact on the economic indicators. This shows that all the attractive projects could absorb the costs of environmental recovery.

52. **For the macroeconomic analysis, results indicated that the proposed Project is viable:** on the one hand, as verified in the analysis at property level, there is an incentive for its adoption by producers; from an aggregate standpoint, an internal rate of return (IRR) of less than 20 percent is perfectly acceptable in all the simulations. From a social perspective, using shadow prices, the IRRs for all scenarios indicated that the proposed Project is macro-economically feasible. According to the projections, an investment of US$25 million[10] will have returns in terms of the benefits of sequestered carbon, considering the hypothesis that 12 percent of the proposed Project area will be implemented and valuing CO2 at US$3/ton or 2.4 percent of the area if the value of CO2 is US$15/ton. Conversely, repaying an investment of US$25 million would require an annual investment of US$3.17 million for 20 years discounted at an annual rate of 10 percent.

53. **Non-quantified benefits.** Because of the theoretical and technical limitations characteristic of environmental projects, various side effects can be generated and difficult to quantify, such as: the national image through the concrete demonstration of the political will to comply with the NDC commitment; the proposed Project's impact on the preservation of water quality and availability, due to its indirect and direct effects on springs; preservation of the affected biome's biodiversity; the "demonstration effect" to producers in general of environmentally correct and profitable practices; and the dissemination of conservation-oriented awareness among producers, even those who cannot be integrated in the proposed Project.

54. **World Bank value added.** The World Bank's value added to this proposed Project relies on its experience in (directly and indirectly) coordinating forest and landscape programs worldwide funded by multilateral and bilateral donors, bringing in experience and knowledge from various countries, and its partnership with the GoB in areas such as NDC implementation, agriculture, and natural resources

[9] PDF–Soils with degraded fertility.

[10] The economic analysis was prepared in September 2017, considering an investment of US$25 million or R$80 million. Since September 2017, the Brazilian currency was depreciated. The exchange rate effective on October 18, 2017 was R$3.17 per US$1.00. On July 11, 2018, the change rate was R$3.82 per US$1.00. Nevertheless, the overall conclusion of the economic analysis remains up-to-date.

management. This place the World Bank in an ideal position to provide needed support to the GoB and contribute to the success of the proposed Project.

B. Technical

55. **This proposed Project will focus on critical watersheds in the Cerrado Biome, thus making it possible to scale up ILM to other watersheds through the application of lessons learned from its implementation.** The proposed Project will act in synergy with other BIP projects and contribute to the achievement of the objectives of the National Policy on Climate Change and the Plan to Prevent and Control Deforestation and Fires in the Cerrado Biome. It will also ensure that rural properties assisted by the proposed Project are in environmental compliance with Brazilian Forest Code rules. The incomes of rural properties, especially those that raise dairy and beef cattle, are expected to increase. The proposed Project's transformational impact will result in a better balance between agricultural productivity and guaranteed natural areas for biodiversity conservation and environmental quality.

C. Financial Management

56. **The Bank performed a financial management assessment (FMA) of the FM arrangements for the proposed Project to be implemented by GIZ and SENAR.** This FMA was carried out in accordance with Bank Policy: Investment Project Financing and Bank Directive: Investment Project Financing and the Financial Management Manual for World Bank-Financed Investment Operations (effective March 1, 2010 and revised February 10, 2017).

57. **The scope of the FMA included:** (a) an evaluation of existing FM systems to be used for the proposed Project monitoring, accounting and reporting; (b) a review of staffing arrangements; (c) a review of the flow-of-funds arrangements and disbursement methods to be used; (d) a review of internal control mechanisms in place, including internal audit; (e) a discussion of reporting requirements, including the format and content of Unaudited Interim Financial Reports (IFRs); and (f) a review of external audit arrangements. The FMA's overall conclusions are that the FM arrangements for the proposed Project are considered adequate; the funds flow, disbursements, monitoring, auditing and supervision arrangements have been designed to respond to the proposed Project's implementation arrangements.

D. Procurement

58. **Assessment of SENAR's capacity to implement procurement: SENAR currently implements another FIP grant** (P143184 - Sustainable Prod. in Areas Previously Converted to Agricultural Use) and a full capacity assessment was prepared in 2014. Its execution track record is acceptable and an assessment update is not deemed necessary.

59. **A full assessment of GIZ's capacity to implement procurement following Bank regulations has been conducted.** Its procurement department is adequately staffed, but it lacks prior experience with Bank procurement regulations. It is proficient in the application of its own procurement rules, clearly described in its internal manuals. These rules have also been assessed and considered acceptable to the Bank. The operational manual will describe how GIZ's procurement rules and procedures are acceptable to the Bank, i.e., up to the national procurement approach defined in the procurement plan; GIZ must

accept the Bank's anti-fraud and corruption guidelines and the Bank's right to audit, passing them on to any contract it signs with proceeds from the grant.; Due to its specific legal and regulatory obligations, GIZ will not finance neither directly or indirectly, a person or entity that is listed on any of the EU's Sanction Lists.

E. Social (including Safeguards)

60. **The proposed Project is expected to yield the following socioeconomic benefits: enablement of landholders to access the resources and other assistance services provided under the ABC Plan**; assurance to landholders that they are fulfilling part of the environmental legislation requirements, thus enabling them to undertake investments in agricultural products that will allow them to access a range of markets which require such compliance; establishment of enabling requirements for landholders (including land-reform settlers and traditional communities) to access target rural credit, and increase of employment and income for landholders (including land-reform settlers and traditional communities) and other partners in the business chain generated by farming activities, thereby contributing to poverty alleviation.

61. **Safeguards.** Operational Policies OP/BP 4.10 (Indigenous Peoples) and OP/BP 4.12 (Involuntary Resettlement) are not triggered. The proposed Project will not interfere with indigenous peoples because there are no indigenous lands within its area of influence (the geographic area of the 53 preselected watersheds). The proposed Project activities will not require land acquisition or imply creation of protected areas. Therefore, involuntary population displacement and/or negative impacts on livelihoods due to land acquisition are not envisaged.

62. **Gender.** A Gender Action Plan (GAP) has been developed for the proposed Project to promote the participation of women farmers in the proposed Project activities. By focusing on capacity-building and extension-service activities that will foster opportunities to access credit lines and apply low-carbon agricultural technologies, the proposed Project can contribute toward addressing some of the key challenges that hinder gender equity in the Cerrado Biome, because it includes a set of activities that the literature considers critical to overcome gender inequalities and empower women. These activities are related to the proposed Project's communication strategy; the preparation of Action Plans for integrated landscape management in selected watersheds; the proposed Project's training and capacity-building activities; and its technical assistance and extension services. The proposed Project's communication strategy will take the appropriate steps to inform women in the selected watersheds about the proposed Project activities and include venues that women producers frequent or to which they have access. The socioeconomic diagnostic of the watershed will incorporate a gender lens to assess the differences in men's and women's development needs and preferences; their differences in access to and control over resources; and the potential distributive impacts of a development intervention on women and men. The proposed Project aims to reach at least 30 percent of female-headed landholdings and/or women producers' enrollment in its capacity-building activities and at least 25 percent of female-headed landholdings' participation in rural extension and technical assistance events. The GAP will be monitored and evaluated through gender-sensitive indicators. This M&E system will allow the PCU to periodically assess the efficiency of the proposed Project approach to promote participation of women farmers in its activities and to benefit from them as well as to take additional measures to enhance participation and improve benefit sharing. See Annex 8 for further information.

63. **Consultation.** The proposed Project forms part of the BIP, which has been widely and publicly submitted for the consideration of diverse stakeholders through informational and consultation sessions. To date, representatives of the private sector, academia, NGOs, social movements, state environmental agencies, indigenous peoples and traditional communities have been consulted. Project-specific consultations were held with key stakeholders (family and non-family landholders' representative organizations, technical assistance and rural extension service providers, specialists from universities, research centers, state and municipal governments, other entities represented in the ABC Plan's State Management Groups, and civil society organizations). The results of this consultation process are reported and included as an annex to the proposed Project's ESMF. The implementing entities have demonstrated adequate procedures and capacity to identify and mitigate impacts under Bank-funded operations. The draft ESMF was approved in January 11, 2018, and made public by SFB (*www.florestal.gov.br*) and by the Bank, was consulted and updated, and the final version was approved by the Bank and made public on August 28, 2018.

64. **Citizen Engagement and Beneficiary Feedback.** The proposed Project's approach toward integrating landscape management requires active engagement for land users to adopt low-carbon agricultural and forest-restoration practices. The proposed Project will mobilize local producers' groups and focus on social inclusion of all beneficiaries in these practices. This will require consistent and transparent messaging to avoid misinformation and ensure equitable access to the proposed Project benefits. The specific elements of the framework for citizen engagement comprise support for the engagement of local landholders in the planning and management of selected watersheds, including monitoring; and support for a feedback mechanism from beneficiaries and stakeholders to be designed to process concerns and questions from beneficiaries and other stakeholders at different levels (from watershed to local), with a view to resolving these concerns and questions within certain timeframes. The protocol and mechanisms for elements of this citizen engagement framework will be detailed in the POM. Quality of its implementation and progress will be monitored through supervision and dialogue.

F. Environment (including Safeguards)

65. **Environment impacts.** The proposed Project is expected to have a positive environmental impact because it seeks to promote the rural environmental cadaster, native vegetation restoration, and the adoption of low-carbon emission agricultural practices. No significant negative impact is expected because all proposed activities are intended to promote and consolidate the adoption of sustainable natural resources and land management practices that would contribute toward reducing carbon emissions. Component 1 will focus on producing maps, digital data and information; designing and implementing a communication strategy; producing monitoring reports; and mainstreaming the integrated landscape approach in public policies and land-use monitoring. Component 2 will support a set of actions focusing on reforestation, agroforestry, seed nurseries, livestock production, training activities, and technical assistance. The proposed Project will observe the Forest Code, also known as the Native Vegetation Protection Law.

66. **Safeguard Polices.** The proposed Project essentially comprises a conservation and agricultural technology transfer Project. It is rated as Category B. The proposed Project will support a set of actions focused on reforestation, agroforestry, nurseries, livestock production, training activities, technical assistance, and land-use monitoring. The following environmental safeguards are triggered: Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Forests OP/BP 4.36; and Pest

Management OP 4.09. Because actual Project activity sites are not known, and in view of the type of works to be carried out, an ESMF was prepared, including social and environmental assessments. The ESMF includes environmental and social screening criteria; potential impact and risk mitigation measures; guidelines to mitigate and/or avoid damage to natural habitats; criteria to ensure that the pesticides used have negligible adverse impacts; institutional responsibilities and monitoring arrangements, including supervision protocols; and stakeholder communication guidelines. The ESMF considers the requirements of OP/BP 4.36 Forests and OP/BP 4.04 Natural Habitats whenever restoration activities are being planned to prevent or mitigate any possible negative impacts. The OP 4.09 is triggered and the proposed Project's ESMF includes guidance on OP 4.09 requirements for field interventions and for leveraging these requirements through extension agents trained under the proposed Project. The ESMF is published and available to the public to provide guidance on potential issues that could arise during the proposed Project implementation.

67. **Safeguard Management Performance.** The implementing entities (SFB, MAPA and SENAR) have demonstrated adequate procedures and capacity to identify and mitigate impacts under Bank-funded operations. The experience gained by MMA (P143334 - FIP: Environmental regularization of rural lands in the Cerrado of Brazil) and MAPA (P143184 - Sustainable Prod. in Areas Previously Converted to Agricultural Use) in previous Projects shows that conducting the process in close consultation and cooperation with landholders minimizes potential conflicts and better responds to their needs and demands.

G. World Bank Grievance Redress

68. **Communities and individuals who believe that they are adversely affected by a World Bank- (WB) supported Project may submit complaints to existing Project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address Project-related concerns. Project-affected communities and individuals may submit their complaints to the WB's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the World Bank Inspection Panel, please visit *www.inspectionpanel.org*.

69. **To handle grievances, the proposed Project will rely on MAPA and SENAR systems, thus avoiding inefficient duplication of structures.** MAPA maintains two main channels to obtain citizen feedback and complaints: a Citizen Engagement Service and a Grievance Redress Mechanism under the responsibility of the ministry's ombudsman. Citizens can access the Citizen Engagement Service through a hotline (08007041995), a facsimile line (61-32182401), by mail, through an electronic form available on MAPA's website, and in person. Complaints can also be filed through MAPA's Ombudsman channels: an electronic form is available on the following site*: http://www.agricultura.gov.br/ouvidoria/contatos-com-a-ouvidoria/por-formulario-web/formulario* and the following e-mail address: ouvidoria@agricultura.gov.br. SENAR maintains

a channel for citizen feedback through its website: *http://www.senar.org.br/fale-conosco*.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Brazil
Integrated Landscape Management in the Cerrado Biome Project

Project Development Objective(s)

To strengthen the adoption of environmental conservation and restoration practices, and low-carbon emission agricultural practices in selected watersheds of Brazil's Cerrado Biome.

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Strengthen the implementation of env conservation and restoration practices in selected watersheds								
Land area where conservation and restoration practices have been adopted. (Hectare(Ha))		0.00	0.00	4,000.00	5,000.00	6,000.00	7,000.00	7,000.00
Landholders adopting environmental conservation and restoration practices. (Number)		0.00	0.00	2,000.00	2,500.00	3,000.00	3,500.00	3,500.00
Landholders adopting conservation and restoration practices -		0.00	0.00	500.00	625.00	750.00	875.00	875.00

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Female (Number)								
Landholders adopting conservation and restoration practices: Male. (Number)		0.00	0.00	1,500.00	1,875.00	2,250.00	2,625.00	2,625.00
Strengthen the implementation of low-carbon emission agricultural practices in selected watersheds								
Land area where low-carbon emission agricultural practices have been adopted. (Hectare(Ha))		0.00	0.00	12,500.00	50,000.00	87,500.00	100,000.00	100,000.00
Farmers adopting improved agricultural technology (CRI, Number)		0.00	100.00	500.00	2,000.00	3,500.00	4,000.00	4,000.00
Farmers adopting improved agricultural technology - Female (CRI, Number)		0.00	25.00	125.00	500.00	875.00	1,000.00	1,000.00
Farmers adopting improved agricultural technology - male (CRI, Number)		0.00	75.00	375.00	1,500.00	2,625.00	3,000.00	3,000.00

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Institutional Development and Capacity Building for Landscape Management								
Institutions provided with capacity building support to improve management of landscapes. (Number)		0.00	2.00	3.00	5.00	5.00	5.00	5.00
Maps on land use and land cover in the Cerrado Biome are made available (TerraClass Cerrado 2016, 2018 and 2020). (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes
Maps on land use and land cover changes in selected watersheds available are made available. (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes
Watersheds where Action Plans have been prepared. (Number)		0.00	0.00	10.00	10.00	10.00	10.00	10.00
Land area under land use planning for landscape management. (Hectare(Ha))		0.00	0.00	0.00	600,000.00	1,050,000.00	1,200,000.00	1,200,000.00
Landholdings adopting land use planning tools for landscape management. (Number)		0.00	0.00	500.00	2,000.00	3,500.00	4,200.00	4,200.00
Mainstreaning Landscape Practices into Selected Watersheds								
People employed in agricultural services and/or restoration practices as a result of the Project. (Number)		0.00	0.00	50.00	100.00	150.00	150.00	150.00
People employed in agricultural services		0.00	12.00	25.00	25.00	37.00	37.00	37.00

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
and/or restoration practices as result of Project -- Female. (Number)								
People employed in agricultural services and/or restoration practices - Male (Number)		0.00	38.00	75.00	75.00	113.00	113.00	113.00
Farmers reached with agricultural assets or services (CRI, Number)		0.00	50.00	1,500.00	3,500.00	4,500.00	5,200.00	5,200.00
Farmers reached with agricultural assets or services - Female (CRI, Number)		0.00	15.00	450.00	1,050.00	1,350.00	1,560.00	1,560.00
Component 3 - Project Management, Monitoring, Evaluation and Communication								
Share of landholders satisfied with agricultural and /or restoration services provided by the Project. (Percentage)		0.00	10.00	50.00	60.00	65.00	70.00	70.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Land area where conservation and restoration practices have been adopted.	Conservation and restoration practices comprise processes that return complete or partial tree cover on forest land through planting or through natural or assisted regeneration processes, which can also include agroforestry, restoration plantations, or small woodlots. The following conservation or restoration practices are envisaged under the Project: Restoration Plans (PRAs) approved; legal reserves and permanent protected areas maintenance and/or enrichment; fencing; natural regeneration; assisted regeneration; planting or direct seeding of native or non-native tree species; silvicultural systems; erosion control; terraces; runoff management; invasive species control; fertilization; disturbance removal; fuel reduction by mechanical means; reintroduction of prescribed fires; fire surrogates. The choice of the conservation and restoration practices depends on soil conditions, the surrounding ecosystem and forest fragments, intensity and historical land use, and natural regeneration potential of each area. This indicator measures the cumulative area of Legal Reserves (RLs) and/or Areas of Permanent Protection (APPs) within private landholdings that, as a result of the Project, incorporated and/or improved at least one of the following conservation or restoration practices: RL and/or APP enrichment; fencing; natural regeneration; assisted regeneration; planting or direct seeding of native or non-native tree species; silvicultural systems; erosion control; invasive species control; fertilization; disturbance removal; fuel reduction by mechanical means; re-introduction of prescribed fires; fire surrogates. The expected average area where conservation and/or restoration practices have been adopted during the Project's lifetime per landholding is 2 ha on landholdings with an average total area of 300 ha. The Brazilian Forest Code defines situations in which landholders are required to recover natural vegetation on their land. Because the recovery of	Annual.	Technical reports; SICAR data; land-use watershed maps.		SFB, SENAR.

	vegetation is a long-term process and includes different alternatives (natural regeneration, seeding, fencing), the Brazilian legislation envisages the recovery of APPs and RL over 20 years within private landholdings. Whatever the technical alternative, the landowner or landholder should formally commit to public authorities to being fully compliant with the law within 20 years by recovering farmlands gradually (a minimum of 10% of the area to be recovered every two years). In this context, the Project expects to plan the process of recovering 70,000 hectares of APPs and RLs within private landholdings in selected watersheds. The total restoration/reforestation process is expected to be achieved in 20 years, but when considering the Project period (5 years) a fraction of the restoration area will be delivered by Project end. Thus, the Project indicator estimates the APP and RL areas adopting recovery practices during the Project period, representing 10% of the total area under the restoration process, also taking into account the time to provide and absorb technical assistance, provide seedlings, etc. Nevertheless, the Project's impact over time should include the restoration of all 70,000 ha covered in the plans, and the additional plans that would use the technical package promoted by trainers and organizations involved in the Project. Related to FAP indicator: area restored or reforested.				
Landholders adopting environmental conservation and restoration practices.	This indicator measures the cumulative number of private landholdings which have RLs and/or APPs that, as a result of the Project, incorporated and/or improved practices. The following conservation or restoration practices are envisaged: Restoration Plans (PRAs) approved; RL and APP maintenance and/or enrichment; fencing; natural regeneration; assisted regeneration; planting or direct seeding of native or non-native tree species; silvicultural systems; erosion control; terraces; runoff management; invasive species control; fertilization; disturbance removal; fuel reduction by mechanical means; re-introduction of prescribed fire; fire surrogates. The Project aims for at least 25 percent of all participants in rural-extension	Annual.	SICAR and ISA systems.		SFB and SENAR.

	and technical-assistance services to be female-headed landholdings. The expected average area where conservation and/or restoration practices have been adopted per landholding is 2 ha, for an average landholding area of 300 ha. Related to FAP indicator: Land users adopting sustainable land management practices as a result of the Project. Relates to CPF indicators: number of landholdings adopting landscape management and/or sustainable agricultural practices as a result of WBG support; number of properties where RLs and/or APPs are implemented and/or land restoration is adopted.				
Landholders adopting conservation and restoration practices - Female		Annual.	CAR system and technical reports.		SFB and SENAR.
Landholders adopting conservation and restoration practices: Male.		Annual.	SICAR system; technical reports.		SFB and SENAR.
Land area where low- carbon emission agricultural practices have	This indicator measures the cumulative land area within private landholdings that, as a result of the Project, incorporated and/or improved at least one of the following practices: restoration of degraded pasture, livestock intensification, crop–livestock–forestry integration system, and crop–livestock system.	Annual.	Technical reports; ISA data; land-use watersheds		SENAR and MAPA.

been adopted.	The expected average area where low-carbon practices have been adopted per landholding is 25 ha, for an average landholding area of 300 ha.		maps.		
Farmers adopting improved agricultural technology	The household irrigation systems will be used for supplementary irrigation of rained agriculture, for diversification of production or for the transformation from a primarily subsidence agriculture towards the production of one or two marketable products, depending on the regional conditions and depending on the farmers' interests. Technical assistance will introduce good agricultural practices adjusted to each situation. These are, among other, the use of organic fertilizer, certified seeds, diversification and shifting cultivation and will be identified during project implementation. The indicator evaluates if at least one good agricultural practice transferred during technical assistance is being adopted by the farmer. Municipal staff using their site visits will evaluate use of agricultural practices or improved agricultural technology. One year after the completion of the first systems, an independent evaluation will confirm monitoring results of the municipal staff. If needed, an additional independent evaluation will be realized during mid-term review.	Annual.	ISA system and technical reports.		SENAR and MAPA.
Farmers adopting improved agricultural technology - Female		Annual.	ISA system, technical reports.		SENAR.
Farmers adopting improved agricultural technology - male		Annual.	ISA system, technical reports.		SENAR.

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Institutions provided with capacity building support to improve management of landscapes.		Annual.	Technical reports.		GIZ.
Maps on land use and land cover in the Cerrado Biome are made available (TerraClass Cerrado 2016, 2018 and 2020).		Biennial.	INPE website.		INPE and EMBRAPA.
Maps on land use and land cover changes in selected watersheds available are made available.		Biennial.	INPE website.		INPE and EMBRAPA.
Watersheds where Action Plans have been prepared.		Biennial.	Technical reports.		SFB and EMBRAPA.
Land area under land use planning for landscape management.		Annual	Technical Reports, SICAR system, ISA system, land-use maps.		SFB, SENAR and GIZ.
Landholdings adopting land use planning tools for landscape management.		Annual.	Technical reports, SICAR and ISA data.		SFB and SENAR.
People employed in agricultural services and/or restoration practices as a result of the Project.		Annual.	Technical reports.		SENAR and GIZ.

People employed in agricultural services and/or restoration practices as result of Project -- Female.		Annual	Technical reports.		SENAR and SFB.
People employed in agricultural services and/or restoration practices - Male		Annual.	Technical reports.		SENAR and SFB.
Farmers reached with agricultural assets or services		Annual.	Technical Reports, ISA data.		SENAR.
Farmers reached with agricultural assets or services - Female		Annual.	Technical reports; training events lists. This indicator measures the cumulative number of farmers who were provided with agricultural services as a result of the project. Agricultural services include training events in all aspects of low carbon		SENAR and EMBRAPA.

			agricultural and conservation and restoration practices and landholdings management; rural extension and technical assistance events; restoration support services.		
Share of landholders satisfied with agricultural and /or restoration services provided by the Project.		Biennial.	Technical reports. Surveys reports.		SENAR and SFB.

ANNEX 1: DETAILED PROJECT DESCRIPTION

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

Cerrado Biome Context

1. Brazil is a country with continental dimensions (8.5 million square kilometers [km2]) and a population of 208 million (IBGE, 2017). Most of the population (84.4 percent) lives in urban centers. The country is also home to an extremely rich variety of flora and fauna; it holds one third of the planet's tropical forests—the Amazon Biome—and other extensive phytochemical territories, such as the Cerrado (savanna), the Atlantic Rainforest (coastal rainforest), the Caatinga (semi-arid regions), and the Pantanal (wetlands).

2. Stretching over 10 states (Goiás, Tocantins, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Bahia, Maranhão, Piauí, Paraná, São Paulo) and the Federal District, the Cerrado Biome covers approximately 200 million ha (Mha; 2.04 million km^2) of the Brazilian Central Plateau, or 24 percent of the country's total land area. Twenty-two percent of the Brazilian population (42.7 million) lives in the Cerrado Biome; 14 percent of this population resides in rural areas. Most of the Cerrado Biome is occupied by private lands and only 8.2 percent of the biome comprises protected areas. Another 4.3 percent is in indigenous lands.

3. The Cerrado Biome is a large area with significant reserves of carbon and water resources and with substantial biodiversity. It holds the sources of South America's three largest river basins (Amazon/Tocantins, São Francisco and Prata), resulting in the region's high aquifer potential and rich biodiversity. The Brazilian Cerrado Biome is considered the world's most biodiverse savanna region and one of the world's biodiversity hotspots. Its great diversity of habitats determines a remarkable alternation of species among different types of vegetation, i.e., 11,627 registered species of native plants. The Cerrado Biome is home to an enormous abundance of endemic species, although these are currently experiencing epic habitat loss.

4. Much of this consolidation of agricultural production has occurred in the Cerrado Biome: a mosaic of savanna–forest with 23 types of vegetation comprising tropical savannas, pastures and forests. Crop agriculture occupies about 22 Mha of the Cerrado Biome (11 percent of the land area). Cattle ranching occupies 54 Mha of pastureland (25 percent of the land area), of which approximately 40 to 80 percent are degraded to a greater or lesser degree, with approximately 50 million head of cattle (nearly 33 percent of the national herd). Findings of the Land Use and Land Cover Mapping of the Cerrado Biome (TerraClass Cerrado report, 2013)[11] indicate that pasture areas occupy 29.5 percent of the biome, while crop agriculture occupies 11.6 percent. Annual agriculture accounts for 8.5 percent and perennial crops for 3.1 percent of the biome's lands.

5. The Cerrado Biome has been the stage for an expansion of agricultural production, mainly through cattle ranching, since the 1940s, and for the commercial production of soybeans, corn and cotton since the 1970s. Livestock farming plays a historical and significant role in the Cerrado Biome's occupation. According to Ferreira Ribeiro (2002), as bovine cattle were spread throughout Central Brazil, cattle raising

[11] http://www.dpi.inpe.br/tccerrado/

became the Cerrado Biome's most important and longest-lasting economic activity. It has remained so for the last three centuries. In the eighteenth century, its expansion was favored by the availability of the meat and leather consumer market in the region's mining centers. This contributed decisively to the consolidation and permanence of cattle raising in later periods (Ferreira Ribeiro 2002).

6. The findings of the TerraClass Cerrado report (2013) indicate that only 54.5 percent of the Cerrado Biome has maintained its natural vegetation. Estimates show that deforestation in the Cerrado Biome is proportionately more severe than in the Amazon. During 2002–2008, deforestation in the Amazon represented 3.3 percent of the biome's area (1.89 Mha/year), with 82 percent of the original forest area remaining, while in the same period the Cerrado Biome lost 7.8 percent of its coverage (2.2 Mha/year) and only 52 percent of the area covered by native vegetation remained (about 10 Mha). In 2010, the size of the deforested area in the Cerrado Biome (1 Mha) was 1.49 times greater than in the Amazon (700,000 ha), representing a higher percentage in relative terms: 0.51 percent in the Cerrado Biome vs. 0.17 percent in the Amazon (Ministry of Environment [*Ministério do Meio Ambiente,* MMA] 2015). In 2014–2015, deforestation of the Cerrado Biome totaled 1.8 Mha, which translates to an average of 948,300 ha/year, while in the Legal Amazon the average annual deforestation rate in the same period was 560,950 ha.

7. Agricultural activity is likely to continue to increase in the Cerrado Biome because it still has very large areas with agricultural and forestry potential. These areas are likely to become more accessible and therefore more attractive to investment, which can take advantage of rising prices in agricultural commodity markets.

8. Brazil's greenhouse gas (GHG) emissions in 2014 dropped 3.8 percent from a year earlier. In fact, the bulk of Brazil's emissions comes from land-use change and forestry (LUCF). In 2014, 33 percent of Brazil's GHG net emissions came from the agricultural and livestock sector, and 18 percent from LUCF-sector activities. Agricultural and livestock activities represent a significant source of GHG emissions in Brazil, mainly due to methane (CH_4) emissions from enteric fermentation in animals, accounting for 87 percent, and nitrous oxide (N_2O) emissions from agricultural soils (mostly from soil fertilization and animal waste disposal[12]).

Project Strategy and Theory of Change

9. The major challenge in the Cerrado Biome's management is to meet the ever-growing demand for agricultural products while conserving natural vegetation, providing critical ecosystem services (such as biodiversity and water for human consumption), and maintaining rural livelihoods. It is necessary to ensure that agriculture can continue to increase while responding to incentives to adopt more sustainable practices that can maintain or increase productivity and profitability while preserving natural resources and ecosystem services and reducing GHG emissions.

10. The complexity of this challenge is due to multiple factors: poor integration and dissemination of knowledge about the region; limited adoption of low-carbon emission agricultural technologies; the incipient native vegetation restoration supply chain; inadequate technical assistance and rural extension;

[12] Ministério da Ciência, Tecnologia e Inovação (MCTI), 2016. Estimativas anuais de emissões de gases de efeito estufa no Brasil. 3a edição. Available at: http://sirene.mcti.gov.br/documents/1686653/1706227/Estimativa+1ed.pdf/64d58e8a-1bc8-4fa6-aa5c-1d23dfeb9020

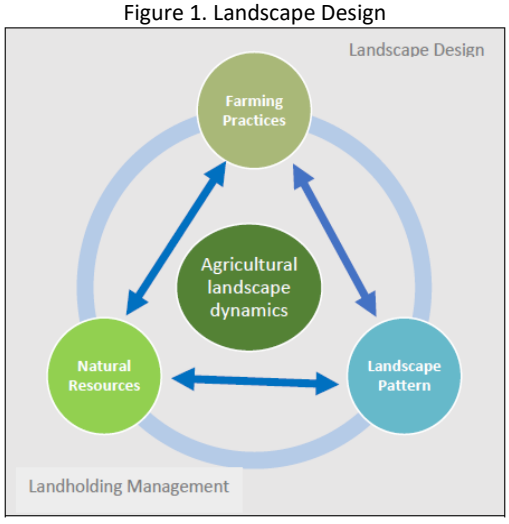
and landholders' resistance to the implementation of the Forest Code.

11. In this context, the proposed Project will adopt an integrated landscape management (ILM) approach in which conservation and production units within the agricultural matrix are managed jointly for long-term sustainability. ILM is an approach to forest restoration that seeks to balance human needs with those of biodiversity, thus aiming to restore a range of forest functions and accepting and negotiating the trade-offs among them. ILM not only allows for a better balance between native and human-dominated areas, but can also define and impose a new landscape configuration that makes it possible to take maximum advantage of the services that landscapes can provide, whether these are targeted to agricultural production, biodiversity conservation, provision of regulation services, or a combination of these services (Metzger and Brancalion 2013[13]).

12. Incorporating social aspects in environmental decision making is what makes this approach different, and landscapes are seen to provide the setting where trade-offs between different land uses and different stakeholders can be resolved (Reed et al. 2016). In addition, this approach signals a strong move away from a narrowly focused conservation-oriented approach to environmental protection to achieve a broad integration of poverty-alleviation goals. In other words, the concerns of people are placed at the center in a landscape approach: it is not just about the "land" or land management.[14]

13. Figure 1, taken from Benoît et al. 2012, shows schematically how interaction between the environment and different farming practices gives rise to a specific landscape.

Figure 1. Landscape Design



14. Figure 2 summarizes the proposed Project's theory of change and its strategy. In this context, forest restoration and low-carbon emission agricultural practices not only allow for a better balance between native and human-dominated areas, but can also define and impose a new landscape configuration that enables agricultural production, biodiversity conservation, carbon sequestration and provision of

[13] Metzger and Brancalion. 2013. Challenges and opportunities in applying a landscape ecology perspective in ecological restoration: a powerful approach to shape neolandscapes. Natureza e Conservação 11(2):103–107, December 2013.
[14] Brazil's NDC Restoration and Reforestation Target. Analysis of INDC land-use targets. World Bank. 2017. Report No. AUS19554.

environmental services.

15. The proposed Project's theory change is based on the following intervention strategies:

- Strengthening the capacities of producers, technicians and institutions;
- Managing, monitoring, evaluating and promoting continuous improvement of ILM: continued learning;
- Integrating agricultural production and compliance with legislation and environmental conservation in the rural environment: multi-functionality of geographic and multi-scale; and
- Engaging and empowering different social actors: multiple stakeholders, participation, capacity building.

16. These strategies will allow the proposed Project to increase knowledge about the Cerrado Biome landscape, promote low-carbon farming practices and practices in the region with environmental liabilities, and conserve vegetation. Concrete actions for the recovery of native vegetation, especially RLs and APPs within ILM, will also promote the maintenance and availability of critical ecosystem services, such as biodiversity, water for human consumption, connectivity of vegetation areas, and sustainability of the population's means of production in rural areas. For this approach, the involvement of local actors will be key: producers and public agencies such as SFB, MAPA, SENAR, MCTIC/INPE, EMBRAPA, and state environmental agencies (*Órgãos Estaduais de Meio Ambiente,* OEMAs).

17. The proposed Project's theory of change is supported by the following assumptions:

- **Technical assistance:** Areas where technical assistance was effective, fostering sustainable management as well as low-carbon emission agricultural practices that yielded incremental financial results, made landholders willing to invest their own money to scale up the adoption of the new practices.[15] Currently, there is a lack of knowledge and understanding among landholders about conservation, reforestation, restoration, and low-carbon agricultural practices. Some practices require strong farm management skills, as well as adequate training and technical assistance for farmers and ranchers. Landholders in the Cerrado Biome have shown a high level of interest in receiving more intensive technical assistance on low-carbon agricultural practices and restoration practices, but the government lacks the required funds to provide it. The premise of the proposed Project is that by addressing this constraint, producers will be more likely to adopt low-carbon practices through credit lines or their own resources. Further information on credit lines and producers' investments is provided below.

- **Legal framework**: The Low-Carbon Agricultural Plan (ABC) and Forest Code (Law 12.651/2012) provide the essential legal framework for supporting and controlling private rural land use, including compliance with reforestation obligations and adoption of low-carbon agricultural

[15] Both the FIP: ABC Project implementation and the field experience of MAPA show that there is a high level of interest in more intensive technical assistance. Thus, FIP-Sustainable Production in areas previously converted to an agricultural use project (FIP: ABC Project) scaled up its supply of technical assistance to landholders. By March 2018, over 5,400 producers had received training on low-carbon emission practices, of whom 1,727 also participated in technical assistance activities. As a preliminary result of technical assistance activities, 76,550 ha are under sustainable management practices, mostly pasture rehabilitation technologies. These lessons were incorporated in the design of the FIP Integrated Landscape Management project.

practices by producers.

- **Spatial management**: Spatial planning and monitoring are crucial elements of integrated landscape management. They guide and control land-use decisions in the landscape. The integrated landscape approach provides the solid technical basis needed to make the trade-offs between conservation and development explicit as well as to foster platforms for negotiation about these trade-offs.

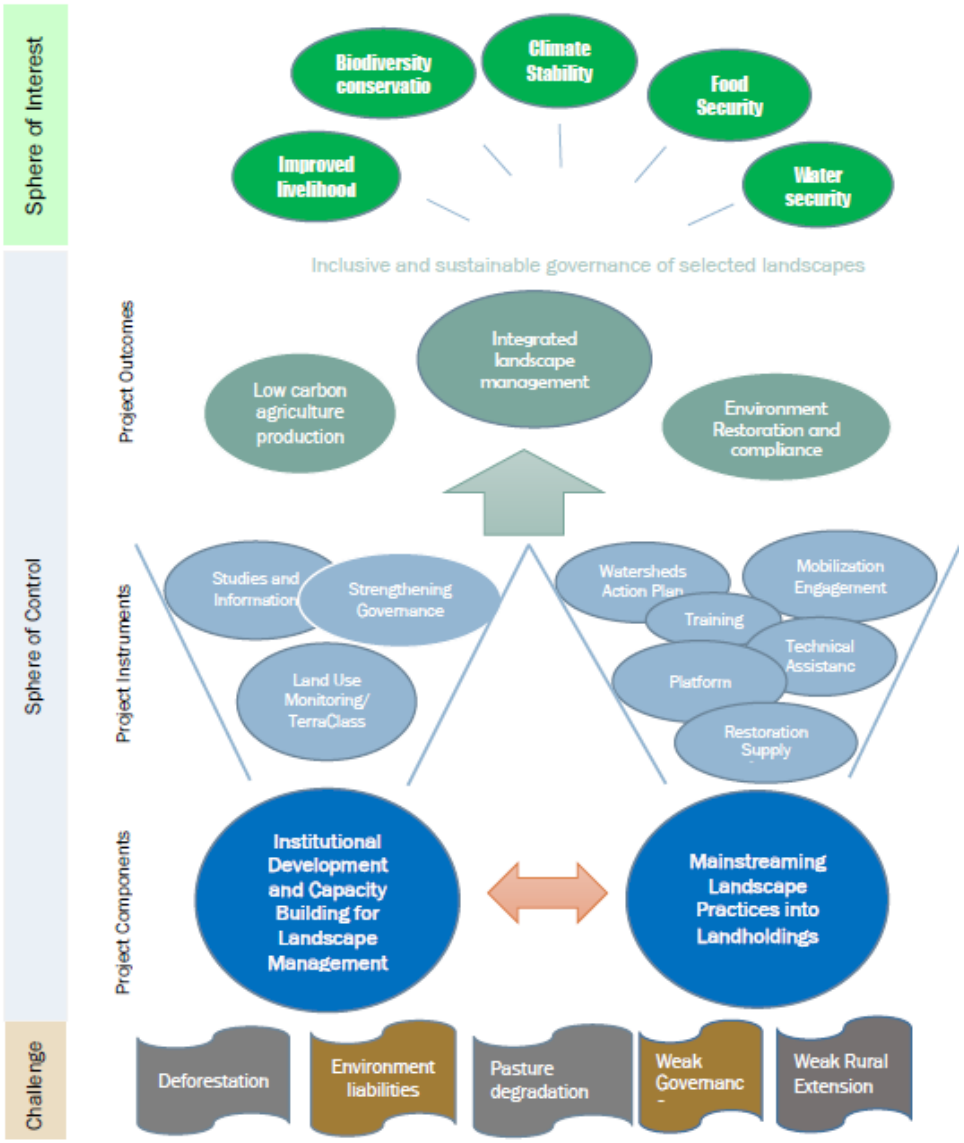
18. Based on these assumptions, the proposed Project's theory of change is that it will scale up the adoption of land-use planning, which integrates agricultural production and biodiversity conservation through the implementation of the following four intervention strategies: (a) monitoring, evaluating and promoting continuous improvement of integrated landscape management; (b) strengthening of the capacities of producers, technicians and institutions; (c) integrating agricultural production and compliance with legislation and environmental conservation in the rural environment; and (d) engaging and empowering different social actors.

19. The theory of change is built around the following core pillars:

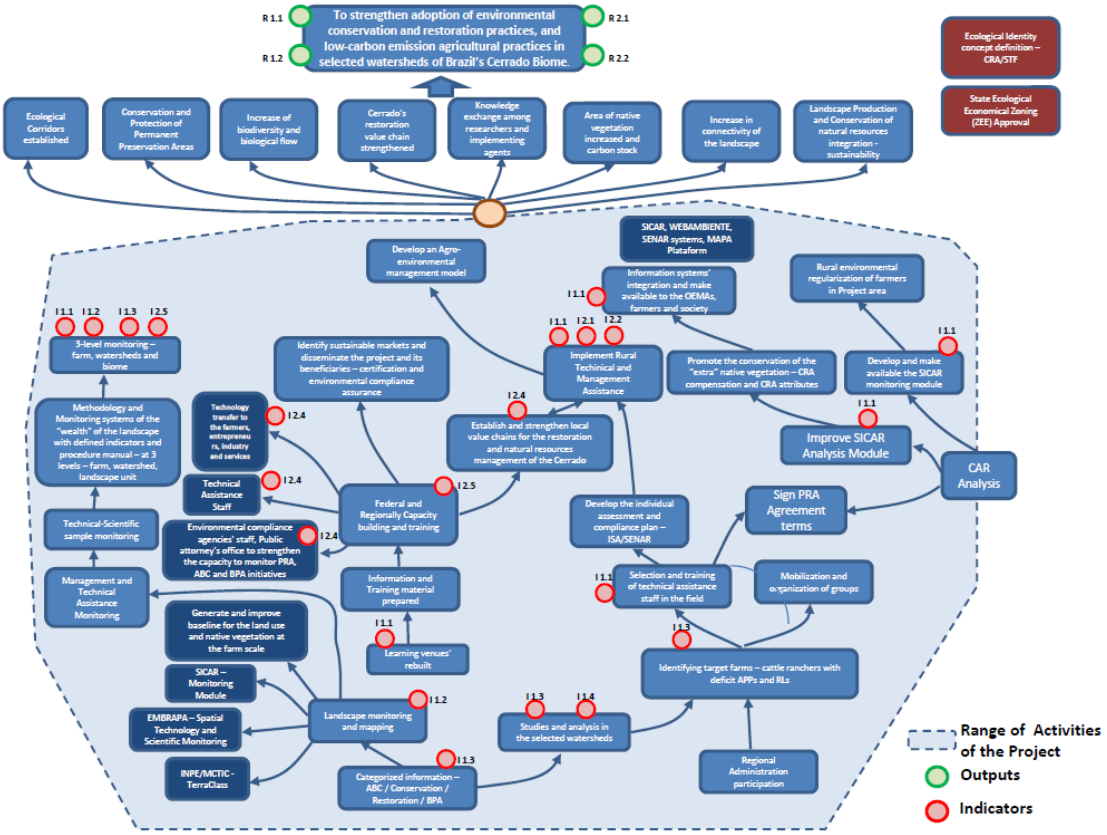
- Improving the implementation of the environmental regularization of rural landholdings through CAR to enable more effective supervision and monitoring of the deforestation and degradation of natural vegetation;
- Promoting restoration and protection of critical habitats within private landholdings (APPs, RLs), including re-establishment of biological and hydrological flows; reconnection of fragmented habitats; and restoration of multiple ecological processes;
- Promoting on-farm sustainable agricultural management, including restoration of degraded pastures and the integrated crop–livestock–forestry system; and
- Promoting land-use planning and integrating agricultural production with biodiversity conservation.

20. The proposed Project's transformational impact will result in a better balance between agricultural productivity and guaranteed natural areas for biodiversity conservation and environmental quality.

Figure 2. Project's theory of change



21. The flow chart below displays graphically the proposed Project's outputs and seeks to more logically order the activities therein. This chart will be part of the Project Operational Manual (POM).



22. Under Component 1: Institutional Development and Capacity Building for Landscape Management, Project executing agencies (MAPA, EMBRAPA, SENAR, SFB, and GIZ) will promote innovation, collaboration and mutual learning. Integrated landscape management implies an ongoing process of negotiation, decision making and evaluation, and is not likely to succeed without a cross-sectoral and multi-institutional learning and negotiation process. Therefore, under this component the proposed Project will bring together agricultural and environmental actors from the Cerrado Biome and will rely on land-use assessment methods that can be effectively used as tools to generate discussion among key stakeholders and negotiate trade-offs; improve communication and innovation; and ultimately foster successful landscape management throughout the Cerrado Biome.

23. Complementarily, under Component 2: Mainstreaming Landscape Practices into Selected Watersheds, the executing agencies will work together to plan and implement technical assistance activities within landholdings and watersheds. This component is characterized by a multi-disciplinary approach aimed at promoting the adoption of low-carbon emission agricultural practices as well as restoration practices, involving technical, economic and social sciences, and a high degree of institutional and producer participation.

Project Site Selection

24. The proposed Project priority areas for ILM were defined based on multi-criteria analyses and a multi-

stage process to maximize environmental and agricultural benefits. These spatial analyses help to achieve scale in the proposed Project and would reduce costs per landholding and hectare and increase environmental benefits. The following six criteria were used to pre-select priority watersheds: (i) Otto watershed[16] with at least 90 percent of its territory located within the Cerrado Biome; (ii) stocking density of cattle per watershed; (iii) deficit of APPs and RLs in each watershed; (iv) natural vegetation cover rate; (v) productive area open after 2008 (anthropized area); and (vi) productive areas open until 2008 (consolidated areas).

25. The potential area of the proposed Project encompasses up to 53 pre-selected watersheds in nine states (Bahia, Goiás, Maranhão, Minas Gerais, Mato Grosso do Sul, Mato Grosso, Piauí, São Paulo and Tocantins) within the Cerrado Biome. These watersheds cover an area of nearly 12.7 Mha, of which 48.6 percent are pasturelands holding an average of 10.98 head of cattle per ha. There are 55,051 landholdings within this potential proposed Project area: 83.4 percent of them are small landholdings, while medium and large landholdings account for 12.4 percent and 4.3 percent, respectively. The average area per landholding equals 130.6 ha. Only 52 percent of these landholdings have been registered in CAR to date. It is estimated that 67.7 percent of the landholdings within these watersheds comply with the requirements of the Brazilian legislation for Legal Reserves, but 62.3 percent of them have no areas of native vegetation besides the minimum legal requirements.[17]

26. The final watershed selection will be completed during the first stage of implementation and the following additional criteria will be used: (i) number of landholders interested in adopting low-carbon emission agricultural and restoration practices; (ii) local institutional capacity and engagement; (iii) stakeholders' participation; (iv) local infrastructure, including roads and communication facilities; and (v) landscape dynamics and functions.

Project Components

27. The proposed Project will be implemented through three distinctive and complementary components: (i) Institutional Development and Capacity Building for Landscape Management; (ii) Mainstreaming Landscape Practices into Selected Watersheds; and (iii) Project Management, Monitoring, Evaluation and Communication.

28. **Component 1: Institutional Development and Capacity Building for Landscape Management (Estimated Cost: US$2.3 million)**. Supporting the development of capacities at the national and local levels to plan and implement a landscape approach in the selected watersheds through, inter alia: (i) land use mapping; (ii) studies and information on the Cerrado Biome; and (iii) strengthening of governance; through consultancies, non-consulting services (e.g., rental of vehicles, maintenance, and information technology services), infrastructure and civil works, the acquisition of goods and equipment, the purchase of satellite images, the carrying out of workshops and training, and the preparation and production of communication materials.

[16] *http://dados.gov.br/dataset/inde_1* Otto basins are contributing areas along stretches of the hydrographic network coded according to Otto Pfafstetter's method for basin classification. Pfafstetter developed a method for numerical coding of river basins, considering as a main input the areas of direct contribution in each section of the hydrographic network. The hydrographic basins correspond to the aggregation of areas of hydrographic contribution, known as *ottobacias*.
[17] FIP: Paisagem. Atlas de Seleção de Bacias Hidrográficas. Serviço Florestal. 2017. Relatório de uso restrito.

29. The application of the ILM approach requires thorough and careful knowledge of the action's focus area. An understanding of land use is essential for having a strategic vision and creating scenarios for the Cerrado Biome's future agriculture and conservation.

30. **Land Use Mapping:** TerraClass aims to map classes of use and land cover (secondary vegetation, agriculture, livestock, mosaic occupation, forestry, urban areas) in all states of the Cerrado Biome and selected watersheds. It includes: (a) characterization of the watersheds' representativeness using the map of the Cerrado Biome's ecoregions and the relief obtained from the SRTM (90 m); (b) mapping of land-use patterns at various temporal and spatial scales from the MODIS time-series study; (c) orbital mapping of soil and its use in deforested areas of the Cerrado Biome for 2016 (retroactive), 2018 and 2020; (d) analysis of the landscape with identification of the main productive systems and their evolution in 2013, 2016 and 2018; (e) remote-sensing actions carried out with specialists from INPE and EMBRAPA; (f) acquisition of 118 Landsat 8/OLI scenes, with a minimum mapping area of 6.25 ha and cartographic scale compatible with 1:250,000; and (g) workshops, presentations, discussions and dissemination of TerraClass results.

31. **Studies and Information on the Cerrado Biome:** These are aimed at strengthening capacity for strategic planning and landscape management, which would include conduction of technical studies focused on restoration, degradation and rural environmental cadaster issues; analysis of environmental, socioeconomic, gender and land-use issues in selected watersheds; support for implementation and promotion of collaboration with universities and other research institutions in developing capacity and the required technical expertise; promotion of better coordination with and institutional enhancement of organizations; and provision of training to relevant staff.

32. **Strengthening of Governance:** A landscape governance arrangement may be formal or informal (ad hoc). In the literature, opinions vary about the effectiveness of different types of landscape governance arrangements. In general, effective landscape governance is aided by the following tools: platform for decision making, permanent communication channels, forums, formal and voluntary networks, as well as existing spatial or jurisdictional structures (e.g., watershed committees, territorial committees). The aim is to support the development of capacities at the national and local levels to plan and implement a landscape approach in the selected watersheds, thus creating legitimacy for the proposed Project and securing the support of local stakeholders. The proposed Project would provide support to facilitate structured watershed committees and participatory mechanisms, and to promote collaboration with local producers' associations.

33. This component would finance consultancies, non-consulting services (e.g., vehicle rental, maintenance, IT services); infrastructure and civil works (training center renovation, reforms, and small-scale constructions); the purchase of goods, equipment and satellite images; workshops and training; and the preparation and production of materials.

34. **Component 2: Mainstreaming Landscape Practices into Selected Watersheds (Estimated Cost: US$15.1 million).** Promoting the adoption of low-carbon emission agricultural practices and restoration practices within private landholdings and help improve production efficiency and environmental compliance through, *inter alia*: (i) an action plan for the selected watersheds; (ii) mobilization and engagement of producers and public environmental institutions; (iii) training; (iv) technical assistance for landholders; (v) monitoring of landholdings' performance; and (vi) support for the forest-restoration supply chain.

35. This component introduces a new strategy for technology transfer to landholders through field technicians trained in low-carbon emission agricultural practices for the restoration of environmental liabilities and productive landholding management.

36. **Action Plan of the Selected Watersheds:** The action plan for the selected area is essential for defining the strategic performance of the proposed Project executors and partners, working on forest restoration, applying sustainable practices for agriculture and forestry, as well as guiding and optimizing the application of resources. This subcomponent includes systemization of information on the selected areas; definition of the plan's structure and scope; participatory workshops to prepare and agree on the plan; and launch and dissemination of the action plan.

37. **Mobilization and Engagement of Producers and Environmental Institutions:** Awareness, participation and effective engagement of rural producers and of technicians and managers of municipal, state and federal public authorities are of great importance for the achievement of the proposed Project objectives. The following actions are envisaged: awareness-raising and engagement workshops; media awareness and engagement campaign; definition of strategies and protocols to formalize the engagement and participation of producers and technicians of public authorities; and the development of an information platform and communication tools.

38. **Training:** Distance and in-person training activities will be carried out, especially, but not exclusively, by EMBRAPA, SENAR and SFB. The following actions are envisaged: planning and preparation of training courses; identification of demands, practices and best practices to be prioritized and applied; production of technical and teaching materials (printed and audiovisual) for the courses; selection and training of course instructors; Forest Code training for public officials, especially on CAR and PRA, environmental legislation and licensing; training of rural producers and their technicians in ABC practices and property management, including courses on no-till farming systems; recovery of degraded pastures; crop–livestock–forestry integration; cultivated commercial forests; farm management and formulation of the proposed Project proposals for funding under the ABC Plan; and controlled fire management and use.

39. **Provision of Technical Assistance:** This is one of the main challenges for the implementation of ILM, forest restoration, production best practices in agriculture and forestry, technical assistance and rural extension. Technical assistance is an informal, ongoing educational service in rural areas. It promotes the management, production, processing and marketing of agricultural and non-agricultural activities and services, including agro-extractive activities, forestry and handicrafts. The technical assistance that SENAR will provide includes individualized productive diagnostic and environmental compliance diagnosis; annual strategic planning when productive, environmental, social and economic information is necessary to establish goals and a schedule for effective action; technological suitability; complementary professional training; and systematic evaluation of results.

40. The proposed Project introduces a new strategy for conservation, restoration and low-carbon agricultural practices transfer to landholders through the training of trainers; a training program for field technicians in conservation, restoration and low-carbon emission agricultural practices for the restoration of environmental liabilities and productive landholding management; a training program for producers, including workshops, events, field days, demonstration units; and field-level technical assistance for selected producers (extension). This strategy also includes stakeholder mobilization, communication, and the establishment of landholders' networks in selected watershed.

41. A Training of Trainers (TOT) process will provide the new trainers with the background knowledge, skills and practical experience needed to promote conservation, restoration, and training and technical assistance in low-carbon emission agricultural practices for technicians, producers and communities. EMBRAPA, MAPA and SFB will be involved in the preparation of the technical content of the training courses for TOT and technicians. The intention is to create a network of providers of technical assistance to landholders.

42. Field technicians will act as coaches for the dissemination of low-carbon emission agricultural practices as well as conservation and restoration practices acquired through research and their application in the field. The role of field technicians is to provide technical assistance to farmers/ranchers; set up a technological reference unit (*Unidade de Referência Tecnológica,* URT); when necessary, assist with the registration of farmers in CAR; and collect data for the Sustainability Indicators for Agroecosystems (SIA) at the beginning and end of the technical assistance program. Based on the lessons learned from the FIP: ABC Project, each field technician will provide assistance to 20 farmers and/or ranchers and set up a URT on one of the farms or ranches.

43. Landholding Platform: The aim is to develop and implement EMBRAPA's environmental web monitoring platform at the regional level, and the level of ownership, beginning with Component 1, to support the decision-making process for the recovery of native vegetation and incorporate existing data and systems. This platform will consider compatibility and integration with the SBF's SICAR monitoring module. Actions include the definition of the platform's structure, scope and governance; survey and systemization of data and information; the development of the platform; and training in the use of the platform.

44. Restoration Supply Chain: The aim is to encourage the productive chain of native vegetation recovery by increasing the capacity of nurseries and other structures to produce native species, and to analyze policies for improving the quantity, quality and accessibility of native species seeds and seedlings. Incentives under this subcomponent include: (a) mapping of the productive-chain structure of the existing restoration in the region covered by the proposed Project (e.g., seedling suppliers, nurseries); (b) seed collection; (c) support to nurseries, including provision of equipment and inputs; (d) training for extension agents and rural producers in subjects such as seed collection and improvement, seedling generation, and restoration techniques; (e) vegetation recovery activities (e.g., planting, agroforestry, maintenance of restored areas); and (f) monitoring of restored areas. To strengthen underdeveloped local productive chains, business plans would also need to be developed and implemented, and nurseries' performance and/or productivity would need to be scaled up or improved.

45. This component would finance civil works, consultancies and trainers, non-consulting services, travel, technical assistance, technical supervisors and field technicians, the purchase of goods and equipment, demonstration units, the organization of events such as field days, and experience sharing.

46. **Component 3: Project Management, Monitoring, Evaluation and Communication (Estimated Cost: US$3.6 million)**. Providing support for the proposed Project's technical and administrative management, including communication, monitoring, evaluation, reporting and auditing activities.

47. This component will finance studies, workshops, training, travel, technical advice, consulting, administrative services, limited software and equipment, and recipient costs.

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

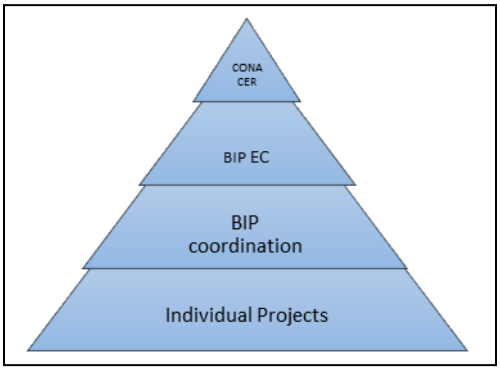
Brazil
FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

Project Institutional and Implementation Arrangements

Brazil Investment Plan (BIP) Arrangements

1. The BIP has developed a management arrangement to ensure synergies among the different projects and institutions during its implementation phase.

2. According to the BIP, the National Commission for the Sustainable Cerrado Program (*Comissão Nacional do Programa Cerrado Sustentável,* CONACER), established in 2006, should act as the consultative committee for the BIP. It will monitor and review the BIP's progress and results, and will advise the BIP's Executive Committee (BIP–EC) on how to improve actions mandated to promote the integration of programs, projects and sectoral policies related to the Cerrado Biome. CONACER is composed of representatives from: (i) MMA; (ii) the Chico Mendes Institute for Biodiversity Conservation (*Instituto Chico Mendes de Conservação da Biodiversidade,* ICMBio); (iii) the Ministry of Agrarian Development (*Ministério do Desenvolvimento Agrário,* MDA); (iv) the Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária,* EMBRAPA); (v) the Brazilian Society for the Progress of Science (*Sociedade Brasileira para o Progresso da Ciência,* SBPC); (vi) the Brazilian Association of State Environmental Entities (*Associação Brasileira de Entidades Estaduais de Meio Ambiente,* ABEMA); (vii) the civil society organizations (including representatives of NGO networks of indigenous and local communities); and (viii) the rural productive sector.



3. The BIP–EC is responsible for the BIP's implementation through the coordination of actions of the different ministries involved and the interaction of FIP projects with other government programs. The EC should stimulate synergies among FIP projects and the involvement of different stakeholders. The EC will include representatives from MMA, MAPA, and the Ministry of Science, Technology, Innovation and Communication (*Ministério da Ciência, Tecnologia, Inovações e Comunicação*, MCTIC). It reports periodically to CONACER about IP progress and results and will also receive feedback and guidance on improving IP execution.

Project's Institutional Partners

4. Although several agencies and institutions will participate in the proposed Project implementation, SFB and MAPA will conduct the proposed Project's overall coordination.

5. Under the institutional leadership of MAPA and SFB, institutional arrangements and possible future partnerships will be formalized, published and communicated to all those involved in the proposed Project execution. The Project Operational Manual (POM) will describe the roles and responsibilities of

each implementing entity as well as the decision-making process and structure. The proposed Project's day-to-day implementation will be undertaken in close partnership among the following:

- MAPA and SFB will play a leadership role in the proposed Project coordination. MAPA will provide overall strategic advice and support for the Low-Carbon Emission Agricultural Plan's implementation. SFB will be responsible for providing overall strategic advice and ensuring implementation of all activities related to CAR, and for environmental and restoration practices (RLs and APPs).
- As the grant agreement recipient, GIZ will act as MAPA, SFB and SENAR's partner under the terms of a Technical Cooperation Agreement to be signed. GIZ will have fiduciary responsibility for the proposed Project, including day-to-day FM operations, budget execution and transaction processing. In addition, it will work closely with SFB on all activities related to CAR and environmental and restoration practices. It will have primary responsibility for monitoring, evaluating and reporting on the proposed Project implementation progress. GIZ's involvement in Brazil has become part of SFB's and MMA's efforts for the rural environmental cadaster, restoration practices as well as sustainable development, since 2014 with the beginning of the CAR technical cooperation Project. In addition, the Brazil–GIZ partnership is driving innovation by acting as a matchmaker between universities and research institutions and partners from the spheres of politics, business and civil society. In a broader country context, some 150 experts, some of them national, are working for GIZ throughout the country. The projects and programs under implementation focus on the conservation and sustainable management of tropical forests, and on renewable energy and energy efficiency. GIZ is also supporting the development of an inter-institutional knowledge platform for practice-oriented educational activities. The focus is on building up the capacity and skills of official bodies, municipalities and NGOs that are responsible for the protection and sustainable use of natural resources. Thus, GIZ has considerable experience in different sectors and will provide value added to managing this proposed Project. It is in a unique and ideal position to provide the needed support to SFB, MAPA, SENAR, EMBRAPA and INPE, having implicitly and explicitly coordinated forest and landscape programs. The FIP Landscape Project will be carried out by GIZ as an integral part of the ongoing CAR Project, which has received €5.5 million in financing. The German Government pre-authorized GIZ to continue with the implementation of GIZ: CAR Project until 2023. Although there is a clear geographical distinction between GIZ: CAR Project (Amazon Region) and FIP Landscape Project (Cerrado Biome), there are great opportunities for synergies by using the experiences of GIZ administrative and technical staff for FIP Landscape Project implementation. The shared use of management and infrastructure will reduce overhead costs. The success of GIZ: CAR Project, based on the long-term relationship between GIZ and SFB/MMA, could also offer several lessons learned and a good *modus operandi* for the management and implementation of CAR and the Forest Code. This joint experience can provide confidence and avoid a "learning curve" that other institutions would face, which is part of the risk reduction.
- SENAR, a private institution housed in the Brazilian Confederation of Agriculture and Livestock (*Confederação da Agricultura e Pecuária do Brasil,* CNA), will be one of the implementing entities. It will be responsible for overall rural extension activities and direct relationships with farmers and producers' organizations. Its Project management team will include a general manager, a technical manager, an administrative manager and support staff, as well as ad hoc advisory services for management and specialized services. SENAR's central office will be responsible for all contracting and procurement and will provide the procured goods and services to SENAR's regional offices for seminars, workshops, courses and other activities. SENAR has 20 years of experience in planning,

conducting and supervising training programs and the education of rural professionals in Brazil, including large-scale producers and family farmers, extension technicians and technical assistance staff. SENAR has highly qualified staff in the fields of planning, training, technical assistance, and financial administration.

- INPE, a research institution associated with MCTIC, will be the leader for mapping of land clearing and land-use changes in the Cerrado Biome and selected watersheds.
- EMBRAPA will be involved in the preparation of the technical content of the training courses. Its researchers will validate all the technologies disseminated by the proposed Project (low-carbon agricultural and restoration practices). EMBRAPA will also be involved in mapping and monitoring land-use changes in the overall Cerrado Biome and selected watersheds.

Project Organizational Structure

6. MAPA and SFB have the overarching policy-level responsibility for carrying out the overall institutional coordination required to implement the proposed Project activities. The Brazil Investment Plan Executive Committee (BIP–EC) has appointed GIZ to manage the grant resources.

7. To this end, GIZ will sign a grant agreement with the World Bank to conduct the proposed Project implementation. This agreement will set forth the specific terms and agreements for grant management and include the following responsibilities: procuring goods and contracting services needed for the proposed Project execution with grant resources; conducting disbursements and the proposed Project's financial execution and accounting; and providing technical support to carry out the proposed Project activities.

8. A Subsidiary agreement will be signed by GIZ and SENAR on activities to promote low-carbon agricultural practices (Component 2). Technical Cooperation agreements would be signed, as appropriate, by MAPA, SFB, SENAR, MCTIC/INPE, and EMBRAPA on landscape monitoring, training, technical assistance, and other landscape management activities.

9. **Project Coordination Unit (PCU).** The PCU is the lead implementing body under SFB. The PCU will be responsible for coordinating the proposed Project implementation; technically supervising the development of the proposed Project activities, including effective coordination of research and development activities at the Project level; coordinating the proposed Project's different actors; and Project M&E. The PCU will be the Bank's main liaison during the proposed Project implementation. As the formal Project manager, it will compile all Project-related information provided by the implementing entities, and will produce technical and safeguard reports as required by World Bank policies. The PCU will also act as the chair for the PAC. The unit will be headed by a Project coordinator and supported by technical specialists and administrative staff. The Project coordinator will work closely with the two Project Executing Units (PEUs) to ensure smooth coordination on questions related to finances and procurement.

10. **Project Executing Units (PEU).** Two PEUs will be established: one in GIZ (PEU–GIZ) and the other in SENAR (PEU–SENAR). Each PEU will have dedicated personnel to ensure the planning and budgeting of the proposed Project activities, FM and procurement, technical supervision and quality control, gender and social inclusion, environmental and social safeguards compliance, and M&E.

11. GIZ will be responsible for the overall administrative and financial management of the proposed Project execution, including systematic reporting to the World Bank. GIZ will be responsible for all

documentation related to the proposed Project planning, execution, and M&E. Other specific management duties include the acquisition of certain goods and services; the selection of individual and corporate consultants under the scope of the proposed Project, in accordance with the provisions set forth in the operational manual; and the maintenance of separate records and accounts in relation to individual assets, services and consultants in order to assist the World Bank in meeting its obligations.

12. **Institutional Partners**. MCITIC/INPE and EMBRAPA will be involved in the mapping of land clearing and land-use changes in the Cerrado Biome and selected watersheds and in capacity-building and training activities. The institutional partners will also provide technical advice on the overall implementation strategy and changes to it. Specific Technical Working Groups will be established to analyze and provide technical guidance on issues that may arise concerning implementation

13. **Technical Working Groups:** Specific Technical Working Groups would be established, as appropriate, to analyze and provide technical guidance on issues that may arise with respect to implementation. These groups will typically include a subset of the members of the PAC complemented by additional technical experts drawn from universities, research institutions, and/or stakeholders relevant to the question at hand.

Financial Management

14. **Planning and Budgeting**. GIZ will prepare an Annual Operating Plan (*Plano Operativo Annual,* POA) which will include the following information: activities to be implemented and their detailed budget (financing needs, the categories of expenditures to be charged with linkages to the procurement plan); annual goals; and deliverables. The POA for the first implementation year should be prepared and approved by the Bank (and thereafter annually). The procedures in place to plan the proposed Project activities, prepare related budgets, and collect information from the units in charge of the different components are adequate, but will require close monitoring. The proposed Project plans and budgets (to be reflected in the POA) will be realistic, based on valid assumptions, and prepared for all significant activities in sufficient detail to provide a meaningful tool to monitor subsequent performance (budget vs. actual variance analysis). This proposed Project does not require counterpart funding, so no monitoring of counterpart funding is required.

15. **Accounting.** GIZ applies the accrual accounting convention. A double bookkeeping system is used, and a chart of accounts is used for all postings.

16. GIZ Orientation & Rules (O+R) Manual provides a comprehensive library of advice, regulations and policies. These regulations are mandatory. Deviations from the standards are decided on, approved and documented by the line manager with management/executive management status. This manual has sections that detail the accounting policies and procedures to be followed, including the procedures in place to ensure that only authorized persons may change or establish new accounting principles, policies or procedures and the controls for the preparation and approval of transactions, to ensure that these transactions are properly executed and recorded.

17. GIZ's computerized accounting and financial system allows for the adequate recording of financial transactions, including the allocation of expenses according to their components, disbursement categories and sources of funds.

18. As a company owned by the German Federal Government, GIZ is subject to a number of requirements under the German "price law" which regulates pricing in government contracts. GIZ accounting system is organized in accordance with these requirements. This ensures the transparent allocation of costs in accordance with the causality principle. GIZ is only allowed to pass on reasonable costs (of an efficiently managed enterprise) to its clients.

19. GIZ also bills a risk markup of (currently) two percent of the production costs of a Project (= all direct costs + indirect costs + all overheads). In contrast to commercial companies, any profit in the annual financial statements is not distributed to the shareholders (the German Federal Government). In accordance with the Articles of Association, it is used for GIZ-financed projects in development cooperation.

20. GIZ will have access to the Bank's Client Connection system for up-to-date information relating to the disbursement of grant proceeds. The proposed Project's accounting records will be reconciled on a regular basis with this information.

21. **Internal Controls.** Segregation of duties is a core principle within GIZ's internal control system, as stated in GIZ's Orientation and Rules (O+R) Manual. Different departments and groups are responsible for IT, finance, HR, etc. At least two organizational units must deal with each transaction/procedure, and this leads to reciprocal control. Under the cross-check principle, a procedure is checked and co-signed by a second person. There is also a rotation of duties. Moreover, there is a horizontal division or segregation of duties between headquarters (HQ) in Germany and the offices in partner countries. With regard to procurement, contracts, financial transactions, Country Offices also have limited authorization and must seek approval from GIZ–HQ for pre-defined transactions. For all transactions and processes the following functions are performed by different units or persons: authorization to execute a transaction; recording of the transaction; and safeguarding of the assets resulting from the transaction. If these principles cannot be adequately applied, e.g., because of restricted staff capacities, management must compensate through additional controls.

22. As mentioned previously, GIZ has its own internal Manual (GIZ's Orientation and Rules [O+R] Manual) that codifies such subjects as accounting, financial management, controlling, internal auditing, procurement and control rules and procedures for HQ, Country Offices and projects. This manual has been translated into Portuguese and adapted for local application.

23. Through its Code of Conduct, GIZ has also set for itself a framework of ethical standards and rules, which is binding for all staff. This Code of Conduct establishes provisions that help to deal with conflicts of interest and prevent corruption at an early stage. It contains clear rules on avoiding active and passive bribery, accepting or giving gifts and other advantages, employing and awarding contracts to closely connected or related persons, and other conflicts of interest. The Code of Conduct can be viewed on GIZ website: *http://www.giz.de/en/aboutgiz/code_of_conduct.html*. GIZ staff must agree to adhere to the Code of Conduct under the terms of their employment contracts. The completion of an online training on "GIZ: Acting with Integrity" is mandatory for all new staff members within 100 days of their employment.

24. Bank reconciliations are prepared by someone other than those who process or approve payments, and all unusual items in the bank reconciliation are reviewed and approved by a responsible official. There is also an adequate system for protecting assets from fraud, waste and abuse.

25. GIZ Corporate Unit for Auditing (StS Revision or Unit), i.e., the Internal Audit Department, is an integral part of the internal control system and provides the following core services:

- auditing and assessing the adequacy and effectiveness of the internal control system;
- auditing the clarity, comprehensibility, reliability and correctness of records kept by the financial and accounting divisions (financial audit);
- auditing the organizational structure and organization of operations and the effectiveness of steering and control mechanisms (operational audit); and
- special investigations (audits and other activities) carried out at the request of the Management Board.

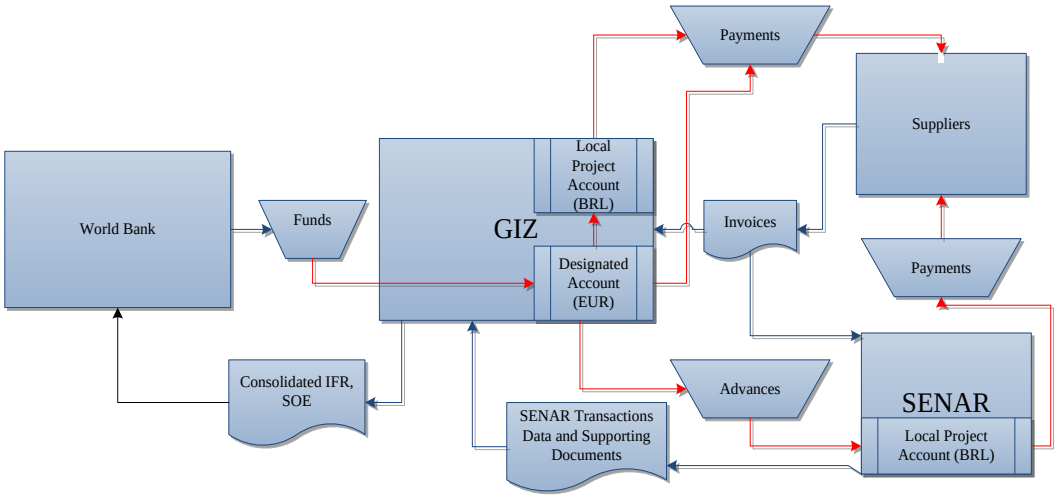
26. The unit can carry out its audits, after prior notification as well as unannounced. It documents any violations of the rules and reports directly and continuously to the Management Board. The unit has unlimited right to information within the scope of its audit mandates. It has access to all company premises and facilities and is authorized to conduct talks with any member of the organizational unit being audited to clarify questions. The unit has staff members with adequate qualifications and experience. The unit will include the proposed Project in its work program. Recommendations of the unit are monitored using an IT system, with the audited business manager having to report back to the unit, after an appropriate period, whether or not the audit recommendations have been implemented.

27. The proposed Project's internal control system will be documented in a simplified Project Operational Manual (POM) to be prepared by the PCU. The POM will comprise descriptions, flow charts, policies, templates and forms, user-friendly tools, tips and techniques to ensure that the approval and authorization controls continue to be adequate and are properly documented and followed with adequate safeguarding of the proposed Project's assets.

28. **Funds Flow.** The disbursement of the proposed Project funds will be processed in accordance with Bank procedures as stipulated in the Legal Agreement and Disbursement Letter. During the proposed Project implementation, the following disbursement methods will be available for use: Reimbursement, Direct Payment, and Advances. The primary disbursement method will be Advances.

29. The following diagram indicates the flow of funds for the Advance Disbursement method from the Bank to GIZ, and the subsequent flow of funds to SENAR:

Disbursement Diagram



(1) The funds will be transferred to a specific pooled bank account (Designated Account) administered by GIZ–HQ. This account is held at a commercial bank acceptable to the Bank. The account will be denominated in Euros (EUR or €). A separate bank account, denominated in local currency (BRL or R$), administered by GIZ Brazil, will be established at a local bank in Brazil to receive funds from the Designated Account and pay for local Project expenditures.[18] Based on GIZ regulations, the balance on the local bank account (liquid funds) may at most be the estimated spending of the proposed Project, for half a month. Funds will also be advanced from this account to SENAR, to implement its activities.
(2) Payments and invoices will be registered in the accounting system once incurred, and the records will be reconciled at the end of each month. The payment requests are submitted by the finance assistants and approved by the Project coordinator.
(3) The IFRs and Statements of Expenditures (SOEs) will be prepared directly from SAP, supported by accounting records. The General Conditions require the Recipient to retain all records (contracts, orders, invoices, bills, receipts, and other documents) evidencing eligible expenditures and to enable the Bank's representative to examine such records. They also require the records to be retained for at least one year following receipt by the Bank of the final audited financial statement required in accordance with the Legal Agreement or two years after the Closing Date, whichever is later. Recipients are responsible for ensuring that document retention beyond the period required by the Legal Agreement complies with their government's regulations.

[18] These local expenditures will be accounted for using the Weighted Average Exchange Cost (and not on a First-In First-Out Basis). Per IPSAS 4 a foreign currency transaction (BRL) shall be recorded, on initial recognition in the functional currency (€), by applying to the foreign currency amount the spot exchange rate between the functional currency and the foreign currency at the date of the transaction. For practical reasons, IPSAS 4 permits the use of a rate that approximates the actual rate, at the date of the transaction; for example, an average rate for a week or a month for all transactions in each foreign currency occurring during that period. This is what the Weighted Average Exchange Cost would approximate. Because the exchange rates between BRL and € have not recently fluctuated significantly, the use of the average rate or Weighted Average Exchange Cost for a period is appropriate.

30. The proposed Fixed Ceiling for the Designated Account will be €5,000,000. The Minimum Application Size for Direct Payment and Reimbursement withdrawal applications will be €1,000,000 equivalent. This Minimum Application Size is not applicable for the retroactive expenditures withdrawal application.

31. The documentation of the use of Advances and Reimbursement withdrawal applications will be through SOEs. Direct payments will be documented by records. GIZ will be responsible for preparing and sending withdrawal applications to the Bank. The proposed Project will also have a four-month grace period to document expenditures incurred prior to the Closing Date. Project expenditures will be reported only after they are approved by GIZ and fully documented, ensuring that the grant proceeds were exclusively used for eligible expenditures. The frequency for the submission of eligible expenditures paid from the Designated Account is at least once every six months.

32. No withdrawal shall be made for payments made prior to the date of the Legal Agreement, except that withdrawals up to an aggregate amount not to exceed US$500,000 equivalent may be made for payments made prior to the Signing Date, but in no case more than one year prior to the Signing Date, for eligible expenditures under Category (1) as set out in the Legal Agreement.

33. Financial Reporting. GIZ already prepares regular financial reports for other projects. These reports are used by management on a monthly basis to compare actual expenditures with budgeted expenditures and scheduled allocations. For this grant, GIZ will prepare and submit to the Bank semiannual IFRs no later than 45 days after the end of each semester. The IFRs will be prepared by GIZ through SAP directly, using information registered in SAP and WINPACCS, using the cash basis.

34. At the end of each fiscal year, GIZ will prepare the annual financial statements for the proposed Project that will be audited. The final-semester IFRs will serve as the Project's annual financial statements, with accompanying notes.

35. The following semiannual IFRs (to be prepared in €) will be prepared for management purposes and submitted to the Bank:

- IFR 1–Sources and Uses of Funds by Category (period-to-date, year-to-date, Project-to-date) showing budgeted amounts versus actual expenditures, (i.e., documented expenditures), including a variance analysis;
- IFR 2–Uses of Funds by Project Component (period-to-date, year-to-date, Project-to-date) showing budgeted amounts versus actual expenditures, (i.e., documented expenditures), including a variance analysis; and
- IFR 3–Designated Account bank reconciliation.

36. External Auditing. GIZ is subject to a substantial number of different external audits: audits are conducted by German federal and state authorities, European Union authorities, clients and external auditors hired by GIZ itself. The audit of the Annual Statement of Accounts is conducted in accordance with Section 317 of the German Commercial Code and generally accepted standards for the audit of financial statements, issued by the Institute of Public Auditors in Germany (*Institut der Wirtschaftsprüfer,* IDW). There have been no qualifications or disclaimers of opinion or emphasis of matter reported in any

of the audit reports in the last three years (reports analyzed up to the end of 2015). Entity financial statements will not need to be submitted to the Bank.

37. For the proposed Project purposes, the external audit of the proposed Project will be performed by a private firm following agreed Terms of Reference (TOR) acceptable to the Bank, and in accordance with International Standards of Auditing (ISAs), issued by the International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants (IFAC), or national auditing standards if, as determined by the Bank, these do not significantly depart from international standards. The audited financial statements will also be prepared in accordance with accounting standards acceptable to the Bank (i.e., IPSAS issued by the International Public Sector Accounting Standards Board of the International Federation of Accountants [IFAC–IPSASB] or national accounting standards where, as determined by the Bank, they do not significantly depart from international standards). The TOR should be prepared by GIZ and be approved by the Bank with a view to appointing the auditors within six months after the Signing Date.

38. The audit report (and any accompanying management letter) should be submitted to the Bank no more than six months after the end of the fiscal year. The Bank will review the audit report and periodically determine whether the audit recommendations are satisfactorily implemented. The Bank also requires that the Recipient disclose the audited financial statements in a manner acceptable to the Bank. Following the Bank's formal receipt of these statements from the Recipient, the Bank will also make them available to the public in accordance with the World Bank Policy on Access to Information.

39. An audit exception to combine the 2018 and 2019 audits may be necessary, depending on the Signing Date of the grant. The cost of the financial statement audit will be financed from the grant.

40. Financial Management Assessment of SENAR. SENAR is currently the implementing entity for another Bank-financed Project, P143184 Grant for the Sustainable Prod. in Areas Previously Converted to Agricultural Use (P143184 / TF014225). SENAR's FM performance under this Project has consistently been Satisfactory. Because an FMA has previously been conducted on SENAR, in the context of a previous Bank-financed Project, it was not necessary to conduct a full FMA for this new Project. For the purposes of this proposed Project, the Bank visited SENAR's offices to confirm the continuing adequacy of SENAR's planning, budgeting, accounting, internal controls, funds flow, financial reporting, and auditing arrangements, including a demonstration of the robustness and functionality of the computerized information systems—RM TOTVS and SGO—used by SENAR.

41. A Project Executing Unit (PEU–SENAR) will be established in SENAR. This PEU–SENAR will include a general manager, a technical manager, an administrative manager and support staff, as well as ad hoc advisory services for management and specialized services. SENAR's central office will be responsible for all contracting and procurement and will provide the procured goods and services to SENAR's regional offices for seminars, workshops, courses and other activities.

42. Summary of detailed arrangements between SENAR and GIZ: Funds Flow and Financial Reporting. GIZ will advance funds to a specific bank account to be opened by SENAR at the Banco do Brasil, to receive funds pertaining solely to the proposed Project. The value of the funds to be advanced approximately every six months will be based on detailed projections and estimates of the funds required to execute the proposed Project activities assigned to SENAR for the subsequent six months. The funds will be advanced

directly to SENAR from GIZ–HQ Designated Account, with SENAR's receiving bank converting these funds (i.e., each advance) to Brazilian Reais from Euros, using the exchange rate of the day. This rate should then be used to convert all of the subsequent expenditures back to Euros for the purposes of reporting back on the use of that advance, by SENAR to GIZ. SENAR will then pay its own Project expenditures from this account, following its own established accounting and internal control processes and procedures. Any commercial bank interest earned on the funds advanced to SENAR must be accounted for separately and can only be used for the proposed Project purposes. SENAR will report to GIZ on the use of the advance(s), at least once every six months. The process of reporting back to GIZ will involve the submission of aggregate (for purposes of the IFRs) and detailed (for purposes of the SOEs) information in both Reais and Euros. SENAR will provide the information to GIZ using formats specified by GIZ, using Excel and drawing on information derived from SENAR's computerized information systems (RM TOTVS and SGO), with the transactions being processed following SENAR's established accounting and internal control processes and procedures. The information reflected in these formats will then be entered in GIZ's accounting and information systems. The POM, apart from describing the above process in more detail, will also specify the matrix of responsibilities, formats, documents and supporting information that SENAR must submit to GIZ. SENAR must also retain all records (contracts, orders, invoices, bills, receipts, and other documents) evidencing eligible expenditures and follow the requirements stipulated in the General Conditions for document retention. SENAR must provide information to GIZ within 20 days after the end of each semester, in order for GIZ to have another 25 days thereafter to consolidate the reporting of both its and SENAR's activities, in the process of preparing the semester IFRs (and any SOEs to be submitted), to ensure that the semiannual IFRs are submitted to the Bank no later than 45 days after the end of each semester. SENAR must also provide information to GIZ by November 15 of each year, in order for GIZ to have another 15 days thereafter to consolidate the reporting of both its and SENAR's planned and budgeted activities, so that the annual consolidated POA can be submitted to the Bank by November 30 of each year. Because the grant is denominated in US dollars, the POA will be prepared in dollars. The auditors hired to audit the proposed Project will also have unrestricted access to the accounting records, supporting documentation, staff and premises of SENAR insofar as they relate to the proposed Project. SENAR will also work together with GIZ to ensure that any requirements or demands arising from the financial statement audit are addressed or promptly responded to, to ensure that GIZ is able to submit the audit report (and any accompanying management letter) to the Bank no more than six months after the end of the fiscal year.

43. Conditions or Nonstandard/Significant Financial Covenants (i.e., relevant issues to be included in the legal documents). There are no FM-related conditions for the Board and/or effectiveness. It is proposed that the POA be submitted for the Bank's no-objection in November of each year, prior to the commencement of the next year's activities.

44. Plan for FM Supervision during Implementation. The Bank will undertake formal supervision of the proposed Project based on a risk profile. Supervision missions will involve such steps as reviewing IFRs; reviewing the auditors' reports and following up on issues raised by auditors, as appropriate; following up on any financial reporting and disbursement issues; discussing FM issues with the proposed Project team; and updating the FM risk and performance rating in the Implementation Status and Results Report (ISR).

Procurement

45. Procurement for the proposed Project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers dated July 2016 and the provisions stipulated in the Legal Agreement. The various items under different expenditure categories are described in general terms

below. For each contract to be financed by the grant, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame will be agreed between the Recipient and the Bank in the Procurement Plan.

46. The World Bank's Standard Procurement Documents will govern the procurement of World Bank-financed Open International Competitive Procurement. For procurement involving National Open Competitive Procurement, the Recipient will use Standard Procurement Documents acceptable to the World Bank that will be included in the operational manuals. GIZ will implement the proposed Project following its own procurement rules, which were assessed and considered acceptable to the Bank. The operational manuals will describe how the procurement rules and procedures are acceptable to the Bank, i.e., up to the national procurement approach defined in the procurement plan. GIZ must accept the Bank's anti-fraud and corruption guidelines and the right of the Bank to audit, passing them on to any contract it signs with proceeds from the grant. Due to its specific legal and regulatory obligations, GIZ will not finance, neither directly or indirectly, or person or entity that is listed on any of the EU's Sanction Lists.

47. Procurement of Works. Procurement of small works and renovations is expected under the proposed Project, most likely to be contracted through Open National Requests for Quotations (RFQ). GIZ will apply commercial practices up to the national approach threshold as defined in the procurement plan.

48. Procurement of Goods. Goods procured under the proposed Project will include, among others: vehicles, boats, satellite images, IT and electronic equipment, and household supplies. Depending on the estimated amounts, procurement will be carried out through Open National Requests for Quotations – RFQ or Requests for Bids (RFB). It may be carried out in accordance with the method known as "*Pregão Eletrônico*" as set forth in Brazilian Law No. 10.520 dated July 17, 2002, provided that documents are acceptable to the Bank, documents include anti-corruption clauses, and the process is carried out under an e-procurement system previously approved by the Bank. GIZ will apply its own procurement rules up to the national approach threshold as defined in the procurement plan.

49. Procurement of non-consulting services. Non-consulting services under the proposed Project will include, among others: the cost of installation of equipment; repairs and/or maintenance services; demarcation surveys; capacity-building support to the implementation and beneficiary's agencies; monitoring, reporting and evaluation-related services; and events, training, workshops, seminars, logistics, travel services, etc. Depending on the estimated amounts, they will be carried out through Open National Requests for Quotations – RFQ or Requests for Bids – RFB. They may be carried out in accordance with the method known as "*Pregão Eletrônico*" as set forth in Brazilian Law No. 10.520, dated July 17, 2002, provided that documents are acceptable to the Bank, documents include anti-corruption clauses, and the process is carried out under an e-procurement system previously approved by the Bank. GIZ will apply its own procurement rules up to the national approach threshold as defined in the procurement plan.

50. Selection of consultants. Consulting services under the proposed Project will include preparation of management plans, land tenure studies, works supervision, engineering designs, communication and marketing plans, asset management, conservation financing studies, development of conservation financing mechanisms, legal advice, and preliminary studies to create PAs, etc. The following methods will be used for selecting consulting firms depending on the nature, estimated amounts and complexity of assignments, attractiveness to foreign firms and need for international expertise: Quality and Cost Based

Selection (QCBS), Least-Cost Selection (LCS), Selection under a Fixed Budget (SFB), Selection Based on Consultant's Qualification (QBS), Single-Source Selection (SSS) both for consulting firms and individual consultants, and Selection of Individual Consultants (IC). The threshold for international advertisement will be stated in the procurement plan. GIZ will apply its own procurement rules up to the national approach threshold as defined in the procurement plan.

51. Operating Costs. During Project preparation, it was agreed that operating costs are those associated with the coordination and implementation of the proposed Project, including: (a) operation and maintenance of vehicles, repairs, fuel and spare parts (except those covered under surveillance activities); (b) equipment and computer maintenance; (c) shipment costs (whenever these costs are not included in the costs of goods); (d) office supplies; (e) rent for office facilities; (f) utilities; (g) travel and per-diem costs for technical staff carrying out supervisory and quality control activities (except those covered under surveillance activities); (h) communication costs, including advertisement for procurement proposals); (i) salaries for the Recipient's operational staff; and (j) all costs associated with audits. Procurable expenses under operating costs to be financed by the proposed Project will be procured following the World Bank Procurement Regulations for IPF Borrowers dated July 2016 or using implementing entities' administrative procedures found acceptable to the Bank, and will be listed in the procurement plan, such as that of GIZ.

52. Others. The need for special arrangements for scholarships, grants, etc. was identified during Project preparation. The procurement procedures and standard bidding documents to be used for each procurement method, as well as model contracts, are presented in the Project's Operational Manuals.

53. Procurement assessment. There are two implementing entities. (1) Assessment of SENAR's capacity to implement procurement: SENAR currently implements another FIP grant and a full capacity assessment is not necessary. (2) Assessment of GIZ: A full capacity assessment of GIZ to implement procurement following Bank Regulations has been conducted. Its procurement department is adequately staffed but lacks experience in Bank's procurement rules. It is proficient in the application of its own procurement rules, clearly described in its internal manuals. These rules have also been assessed and considered acceptable to the Bank and their application will be detailed in the Project's operational manual.

Table A3-2: Procurement Action Plan

Act	Description	Action	Timeframe
1	Quality of TORs and technical specifications	Reach out for experts' advice on the definitions of the ToRs and specifications. Technical concurrences to technical documents to be issued by the TTL.	Throughout implementation. Before launching of each procurement process.
2	Weak and imprecise cost estimates	Base estimates on market data and not only on official tables issued by the government.	Throughout implementation.
3	Companies involved in fraud and corruption issues	Maintain a strict control over the companies and individuals that are debarred by multilateral development banks.	Throughout implementation.

54. All bidding documents and contracts, regardless of the amount and procurement method, are required to have the anticorruption (A/C) clause as an eligibility condition.

Procurement Plan

55. Both executing agencies must prepare a Procurement Plan in STEP for the first 18 months of the proposed Project implementation, providing the basis for the procurement processes. This plan was agreed upon by the Recipient and the Bank before negotiations. The Procurement Plan will be updated in agreement with the Bank on a biannual basis or as required to reflect actual proposed Project implementation needs and improvements in institutional capacity.

Environmental and Social

Environmental

56. The proposed Project is rated as Environmental Category B. The proposed Project will assist landholders in implementing the Forest Code (Law 12.651/2012) and promote low-carbon emission agricultural technologies, the recovery of degraded pasture land, and the implementation of integrated crop–livestock–forestry systems under the Low-Carbon Emission Agricultural Plan (*Plano ABC–Agricultura de Baixa Emissão de Carbono*) in selected watersheds.

57. The proposed Project is expected to have an overall positive impact on the environment because it seeks to promote the protection of APPs and RLs, reforestation, recovery of degraded pastures, and reduction in the environmental impacts of agricultural activities mainly through rural extension activities. The agricultural and restoration practices to be promoted are more environmentally sustainable than conventional production practices. The proposed Project's expected benefits, which include better soil fertility, increased agricultural productivity and food security, greater availability and quality of water resources, reduced deforestation, enhanced biodiversity, and climate-change mitigation, will greatly outweigh the negative impacts likely to be generated. The proposed Project will adopt an integrated landscape approach aimed at sustainably managing land for multiple purposes and functions.

58. Potentially adverse environmental impacts are not expected because these will be avoided or minimized through appropriate preventive and mitigation measures. The following environmental safeguards are triggered: Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Forests OP/BP 4.36; and Pest Management OP 4.09.

59. An Environmental and Social Management Framework (ESMF), including social and environmental assessments, will provide guidance on potential issues that could arise during the proposed Project implementation. Periodic Bank supervision missions to the proposed Project will verify compliance with Bank safeguards and recommend corrective actions when applicable.

Social

60. Safeguards. Operational Policy OP/BP 4.10 (Indigenous Peoples) is not triggered. The proposed Project will not interfere with indigenous peoples because there are no indigenous lands within its area of influence (the geographic area of the 53 preselected watersheds). Indirect benefits are expected for traditional communities and indigenous peoples because the proposed Project activities may contribute toward reducing pressures on remaining forests and/or native forest areas, protecting headwaters and riparian zones, improving the physical, chemical and biological conditions of the soil, and reducing water

and soil pollution.

61. Operational Policy OP/BP 4.12 (Involuntary Resettlement) is not triggered. The proposed Project activities will not require land acquisition or imply creation of protected areas. Therefore, involuntary population displacement and/or negative impacts on livelihoods due to land acquisition are not envisaged.

62. Gender. A gender analysis was previously conducted during preparation of the FIP: Sustainable Production in Areas Previously Converted to Agricultural Use (P143184) and the FIP: Environmental Regularization of Rural Lands in the Cerrado of Brazil (P143334) to understand the role of women in the Cerrado Biome's small- and medium-scale farming systems. According to the 2006 Agricultural Census (IBGE), 27 percent of landholders in the Cerrado Biome area are women. Detailed data on ownership by farm size were not available but empirical evidence indicates that male ownership and professional management tend to increase with property size. Nearly 30 percent of total participants in SENAR's training events are women. Since 2010, over 10,000 women have participated in the abovementioned trainings in 12 Brazilian states, five of which are part of the proposed Project's targeted areas. The participation of women increases significantly in nutrition, food-safety, health, and handicraft courses provided by SENAR. Since 2010, SENAR has promoted trainings specifically designed for women in rural areas, with the aim of strengthening their participation in the business decision-making process, including topics on business and financial management, leadership, public relations and planning, as well as information on labor rights, environmental, and plant and livestock health issues.

63. A Gender Action Plan (GAP) has been developed for the proposed Project with the aim of encouraging the participation of women farmers in the proposed Project activities. This GAP focuses on four areas that are commonly pointed out by the literature as critical for women's empowerment and gender equity in rural development: (a) access to information; (b) participation in policy planning; (c) access to training and capacity-building activities; and (d) access to technical assistance and extension services. The GAP will be monitored and evaluated according to gender-sensitive indicators. This M&E will enable the Project Technical Unit to periodically assess the efficiency of the proposed Project approach to promote participation of women farmers in its activities, benefit from them, and take additional measures to enhance participation and improve benefit sharing.

64. Consultation. The proposed Project forms part of the BIP, which has been widely and publicly submitted for the consideration of diverse stakeholders through informational and consultation sessions. To date, representatives of the private sector, academia, NGOs, social movements, state environmental agencies, indigenous peoples and traditional communities have been consulted. Project-specific consultations were held with key stakeholders (family and non-family landholders' representative organizations, technical-assistance and rural-extension service providers, specialists from universities, research centers, state and municipal governments, other entities represented in the ABC Plan's State Management Groups, and civil society organizations). The results of this consultation process will be reported and included as an annex to the proposed Project's ESMF. The experience gained by MMA (P143334 - FIP: Environmental regularization of rural lands in the Cerrado of Brazil) and MAPA (P143184 - Sustainable Prod. in Areas Previously Converted to Agricultural Use) in previous Projects shows that conducting the process in close consultation and cooperation with landholders minimizes potential conflicts and better responds to their needs and demands. The implementing entities have demonstrated adequate procedures and capacity to identify and mitigate impacts under Bank-funded operations.

65. Citizen Engagement and Beneficiary Feedback. The proposed Project approach of integrating landscape management requires active engagement for land users to adopt low-carbon agricultural and forest restoration practices. The proposed Project will mobilize local producers' groups and focus on social inclusion of all beneficiaries in these practices. This will require consistent and transparent messaging to avoid misinformation and ensure equitable access to the proposed Project benefits. The specific elements of the framework for citizen engagement include support for the engagement of local landholders in the planning and management of selected watersheds, including monitoring; and support for a feedback mechanism from stakeholders and beneficiaries, to be designed to process concerns and questions from beneficiaries and other stakeholders at different levels (from watershed to local), with a view to resolving these concerns and questions within certain time frames. The protocol and mechanisms for elements of this citizen engagement framework will be detailed in the POM. The quality of its implementation and progress will be monitored through supervision and dialogue.

66. Grievance Redress Mechanisms. To handle grievances, the proposed Project will rely on MAPA and SENAR systems, thus avoiding inefficient duplication of structures. MAPA maintains two main channels to obtain citizen feedback and complaints: a Citizen Engagement Service and a Grievance Redress Mechanism under the responsibility of the ministry's ombudsman. Citizens can access the Citizen Engagement Service through a hotline (08007041995), a facsimile line (61-32182401), by mail, through an electronic form available on MAPA's website, and in person. Complaints can also be filed through MAPA's Ombudsman channels; an electronic form is available on the following site: *http://www.agricultura.gov.br/ouvidoria/contatos-com-a-ouvidoria/por-formulario-web/formulario* and the following e-mail address: ouvidoria@agricultura.gov.br. SENAR maintains a channel for citizen feedback through its website: *http://www.senar.org.br/fale-conosco*.

Monitoring and Evaluation

M&E arrangements

67. The proposed Project adopts a multi-scale M&E approach, i.e., at watershed and landholding scales. The selection of indicators was designed to reflect the landscape approach within landholding activities, conservation objectives, as well as stakeholders' participation. In addition, the use of corporate core indicators, FAP performance indicators, and Brazil CPF progress indicators will allow the results and impacts to be aggregated at BIP, FIP and World Bank Group corporate levels.

68. The monitoring of the proposed Project outputs will be conducted in partnership with the various implementing entities. GIZ will be responsible for monitoring the progress of the proposed Project's results and impacts. To monitor and evaluate the proposed Project's execution, GIZ will develop and make available an electronic system for monitoring and evaluating the proposed Project execution.

69. A Results and Monitoring Framework was fully developed and provided specificity in terms of indicators, data-collection methodology, reporting responsibilities, and frequency of M&E activities. In the proposed Project results framework, the baseline values for the proposed indicators are expected to be zero because the indicators are stated to measure the outputs and outcomes as a result of the proposed Project support. A "zero" in the baseline means that the proposed Project has not begun to contribute to the provision of the expected output or outcome. Subsequently, the data should be cumulative; that is, the data in the reports should represent the cumulative numbers of people, hectares,

etc. The POM will provide relevant details on the M&E methodology and implementation.

70. Project progress reports will be submitted to the World Bank annually. The proposed Project execution and results monitoring will employ the reports of systems that are already in use, such as SICAR, ISA, TerraClass and others. The proposed Project M&E will be conducted in accordance with the BIP's M&E plan and established FIP rules and procedures.

M&E at Landscape level

71. Component 1 focuses on enhancing monitoring capacity at Cerrado Biome and selected watershed levels, currently considered a bottleneck in the long-term implementation of ILM.

72. Land-use mapping in the selected watersheds (1:50.000 scale) will map classes, land use and cover, secondary vegetation, agriculture, livestock, mosaic occupation, forestry, and urban areas. These data will provide biennial information on producers' adoption of agricultural and restoration practices.

73. This mapping will be integrated in the existing Terrabrasilis platform and the Program for Environmental Monitoring of Biomes *(Programa de Monitoramento Ambiental dos Biomas Brasileiros*[19]*).* MCTIC/INPE and EMBRAPA will be responsible for mapping and monitoring land-use changes in the selected watersheds.

M&E at Landholding Level

74. The PCU will conduct surveys to evaluate the impact of the communication process, trainings and dissemination campaigns on participants' awareness of CAR, proactive conservation and restoration, and low-carbon emission agricultural practices, with the objective of improving the proposed Project's messages and local participation.

75. Technical supervisors, in collaboration with field technicians, will collect monthly data on overall performance and activities and on social and environmental safeguards compliance, and will visit participants during field days. These data will provide up-to-date information on producers' adoption of practices, issues that may arise, and solutions that need to be identified.

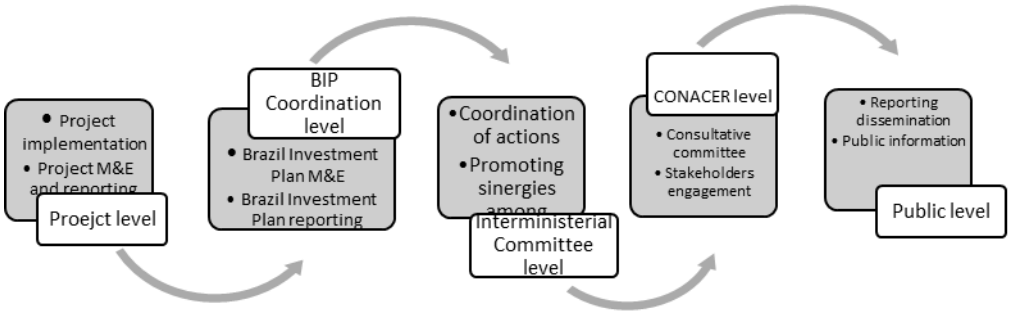
76. Assessment of Sustainability Indicators in Agroecosystems (*Indicadores de Sustentabilidade em Agroecossistemas*, ISA[20]). The ISA tool will monitor these indicators in assisted landholdings. ISA includes economic indicators (farm income, profitability and productivity), environmental indicators (biodiversity, animal welfare, water use, soil health) and social indicators (disaggregated by gender where appropriate). Field technicians will assist with ISA data collection. SENAR will have primary responsibility for tracking progress related to ISA.

77. Rural Environmental Cadaster System (*Sistema Nacional de Cadastro Ambiental Rural,* SICAR). In terms of the number of landholdings and the area registered in CAR, adherence to the Plan to Rehabilitate

[19]Portaria No. 365, November 27, 2015.
[20]For more information on ISA, see Agroecosystems Sustainability Indicators Analysis – H. Gunsu Emesi, Iowa State University http://www.extension.iastate.edu/NR/rdonlyres/1067F46A-3C8B-4BBD-A9DB678ED320C962/82665/9_ppp_gunsu08_421.pdf

Degraded Areas (PRADA), and establishment of the Recovery Plans, SICAR will automatically generate progress reports and statistics, disaggregated by landholding type (family or non-family). Baseline data for monitoring each selected watershed are already available in the system. SFB will have primary responsibility for tracking progress related to SICAR.

78. Spatial and alphanumeric data from the registration and rectification of rural properties in CAR, conducted by ATER agents, will be inputted in SICAR. These data include registration/rectification:



perimeter of property, consolidated areas, remnants of native vegetation, rivers and springs (the system generates APPs), proposed RLs, etc.; and consolidated areas to be compiled in APPs and RLs, alternatives for re-composition, schedule, etc. Project progress results related to the recovery of APPs and RLs in rural properties registered in CAR will be monitored through the SICAR Monitoring Module, which has high spatial-resolution satellite images classified in accordance with the characteristics defined in the Forest Code (Law 12.651/2012).

M&E Reporting

79. Project progress reports will be submitted to the World Bank twice a year. In addition, the proposed Project M&E will be conducted in accordance with BIP and FIP rules and procedures.

80. The monitoring of the proposed Project outputs will be conducted in partnership with the various implementing entities. The annual monitoring reports will be used by the PCU (when preparing the annual work plan and budget) and the supervision missions to ensure that the proposed Project is on track. The Brazil Investment Plan Executive Committee (BIP–EC) will also oversee the communication of monitored information and will provide input to the BIP M&E system.

81. The diagram below shows the BIP's simplified monitoring, evaluation, and reporting chain.

Role of Partners

82. As mentioned previously, the main partners will establish a Technical Cooperation Agreement specifying each partner's responsibilities:

- As the grant recipient, GIZ will act as MAPA, SFB and SENAR's partner under the terms of a Technical Cooperation Agreement to be signed. This grant agreement will co-finance the ongoing BMZ-commissioned CAR Project to enlarge and upscale its scope. GIZ will have FM and fiduciary responsibility for the proposed Project, including day-to-day FM operations, budget execution and transaction processing. In addition, GIZ will work closely with SFB on all activities related to the ongoing BMZ-commissioned CAR Project and environmental and restoration practices.
- MAPA, together with SFB, will play a leadership role in Project coordination. MAPA will also provide overall strategic advice and support for the Low-Carbon Emission Agricultural Plan's implementation; and SFB will be responsible for providing overall strategic advice and ensuring implementation of all activities related to SICAR, and for the training methodology with SENAR and EMBRAPA on environmental and restoration practices (RLs and APPs).
- SENAR, the agricultural sector's leading national rural extension and development agency, will support the production, extension and applied research activities envisaged as part of all components. SENAR uses a training methodology focused on the participation of trainees, in which their experience and expectations are valued. All SENAR agents, instructors, supervisors and technical staff are trained in this methodology. Trainers develop instructional plans to make the learning process efficient and effective. The plans include the educational goals, content, instructional techniques and resources to be used. They stipulate the procedures for evaluation and calculate the lead-time required for implementation.
- INPE, a research institution associated with MCTIC, will be the leader in mapping land clearing and land-use changes in the Cerrado Biome and in selected watersheds.
- EMBRAPA will be involved in the preparation of the technical content of the training courses and in training. EMBRAPA research will validate all the practices disseminated by the proposed Project (restoration and low-carbon agricultural practices). EMBRAPA will also be involved in mapping and monitoring land-use changes in the overall Cerrado Biome and in the selected watershed.
- OEMAs, universities, watershed committees and rural associations will be engaged in this initiative.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

Strategy and Approach for Implementation Support

1. Implementation support for the proposed Project will focus on the functions and activities typically monitored by World Bank task teams during supervision, including monitoring of technical activities, management functions (administration, FM, procurement), and compliance with safeguards policies.

2. The proposed Project is expected to have an overall positive environmental and social impact because it seeks to promote the protection of APPs and RLs, reforestation, recovery of degraded pastures, and reduction of the environmental impacts of agricultural activities mainly through rural extension activities. In this context, the environmental and social risks are rated Low.

3. MAPA and SFB, which are involved in overall Project management, have a mandate and experience in previous Bank-financed projects. The implementation support strategy envisages taking advantage of MAPA, SFB, SENAR and INPE's existing knowledge and experience with Bank-financed projects.

4. The successful collaboration among implementing entities will be critical for the proposed Project's progress and success. Although the governance risk is Substantial, the relationship among implementing entities is expected to be strengthened during implementation. Two factors will be especially important during the implementation phase of the proposed Project's life cycle: (i) managing communications among agencies, and (ii) maintaining trust among them.

5. The strategy for implementation support has been developed on the basis of the previous FIP Brazil projects, the proposed Project design, and measures required during implementation. The strategy remains a flexible tool that may be amended during the proposed Project supervision in response to learning from the proposed Project's implementation process.

6. The Project Executing Units (PEUs) will be responsible for developing, setting up, and maintaining the proposed Project's management system, which will systematically collect the information needed to track progress achieved, generate financial information, and document compliance with safeguards policies. Information generated by the CAR and ISA systems, as well as by Component 1 activities, complemented by information emerging at the time of the midterm review, will be used to adjust operational procedures and make any necessary midterm corrections to the proposed Project implementation.

7. It is often crucial for the proposed Project success to have staff with extensive experience in the country as well as a social scientist to help develop the dialogue with stakeholders. The World Bank's office in Brasília will be the main source of the proposed Project support: it has qualified technical, environmental, agricultural, social, safeguards and fiduciary staff available to follow up on the proposed Project's implementation.

Implementation Support Plan and Resource Requirements

8. The proposed Project will require ongoing implementation support for fiduciary management; governance and institutional arrangements; monitoring, evaluation and reporting management; and stakeholder engagement, gender participation and communication.

9. FM supervision: the proposed Project supervision will involve review of IFRs; review of auditors' reports and follow-up on issues raised by auditors, as appropriate; follow-up on any financial reporting and disbursement issues and on capacity development and support; discussion of FM issues with the proposed Project team; and updating of the FM risk and performance rating in the Implementation Status and Results Report (ISR).

10. The Bank will conduct at least annual supervision missions, desk reviews and field visits to follow up on the proposed Project implementation, supported by FM, procurement, agricultural, social and environmental specialists, as well as safeguards, IT and climate-change specialists whose specific support missions may be required during the implementation period.

11. The table below summarizes the focus of implementation support.

Time	Focus	Skills Needed	Resource Estimate SW/year	Partner Role
First 12 months	Selecting and detailing the assessment of watersheds and planning field interventions in each selected area	Environmental and agricultural technical expertise	4 SW	Provide staff, conduct analyses
	Project implementation progress: technical review, operations management	Project management (TTLs), operational expertise	23 SW	Project management: staff capacity, space and equipment
	Fiduciary implementation support and training for GIZ, SFB, SENAR and MAPA	Financial and procurement expertise	4 SW 2 SW	Fiduciary management: staff capacity, space and equipment, systems
	Interinstitutional communication and stakeholder engagement	Social expertise	3 SW	Provide staff and communications channels
	Monitoring, evaluation and report process	M&E expertise	2 SW	M&E arrangements and responsibility
12 to 48 months	Conducting site visits	Environmental and agricultural technical expertise	4 SW	
	Reporting, publicizing outputs and lessons learned	Reporting and communication expertise	3 SW	
	Safeguards supervision missions	Safeguards expertise: social and environmental	4 SW	Follow safeguards policies, M&E
	Financial and procurement process reviews, implementation support	Financial and procurement expertise	5 SW 4 SW	Provide staff, systems

	Project implementation progress: technical review, operations management	Project management (TTLs), operational expertise	15 SW	Project management
	Preparation of Midterm Review: economic analyses; M&E; communication materials	M&E and reporting expertise	3 SW	

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
TTL, environmental, agricultural, operations, M&E, social, communications	Bank supervision will require 32 SWs for first FY and 29 for subsequent FYs (mainly senior technical staff)	Two field trips in Brazil per fiscal year; two international trips per fiscal year	Trips may include participation in FIP international meetings and FIP exchange missions
FM	4 SWs for first FY, 5 SW for FY2 and 3 SW for subsequent FYs (mainly senior technical staff)	Two field trips in Brazil per fiscal year	
Procurement and disbursement	4 SWs for first FY and 3 SW for subsequent FYs (mainly senior technical staff)	Two field trips in Brazil per fiscal year	
Technical expertise enhancement: IT; M&E, landscape, climate change	6 SWs per FY	Two field trips in Brazil per fiscal year	

ANNEX 4: PROJECT ECONOMIC AND FINANCIAL ANALYSIS

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

1. Approach. Financial and macroeconomic assessments were carried out to estimate the cash flow and price sensitivity for low-carbon emission agricultural practices and forest recovery, as well as the proposed Project's macroeconomic viability through shadow prices and value of potential CO2 captured. For the financial evaluation, the projections had multi-year investments, including the first-year of the proposed Project costs, using an annual interest rate of 7.5 percent. The same applied for the credit line of the BNDES–ABC Program, assuming an average farm size of 1,000 ha with 200 ha of RL that can be restored and 800 ha of agricultural and/or livestock production. For this analysis, two scenarios were considered (Scenario 1: 100 percent investment;21 Scenario 2: partial investment22), and technical production assumptions were made for four different activity levels expected to be implemented by farmers after the proposed Project interventions:

Level I: Conventional livestock pasture systems, grazing soils with high level of degradation;
Level II: Adoption of no-tillage system;
Level III: Adoption of crop-livestock integrated system (CLI);
Level IV: Adoption of crop, livestock and forest integration system (CLFI).

2. In addition, two technical scenarios were considered for the RL recovery projections: mechanized and not mechanized.

3. For the macroeconomic analysis, the private and social projections used an annual discounted rate of 10 percent, as well as shadow prices, value of potential CO_2 capture, option value plus existence value, and hedonic pricing. The analysis also considered the expected consolidation of Level I, II, III and IV activities under the proposed Project, spread over 1,600,000 ha where 44,000 Project-targeted properties are located. Projections were made for four scenarios[23] using the following three technologies: (i) Livestock No-tillage[24] (*Pecuária Plantio Direto,* PDF); (ii) CLI 3 Areas—PDF; and (iii) CLFI Simple Row 2x22—PDF. All the scenarios considered that the producer has already made part of the investments as well as a 25 percent recovery of the RL.

4. Findings. For the financial analysis, the results of the different activity levels have used specific premises and should not be extrapolated to particular cases. Among the projections under Scenario 1, with 100 percent of investments, all practices were attractive except for pasture-recovery technology, considering the adopted minimum attractiveness rate of 7.5 percent. The price-variation sensitivity analysis showed the robustness of the investments and that with a 10 percent increase in the price of

[21] Landowners are starting investments in production from zero.
[22] Landowners have already established production activity and are making partial investments.
[23] Scenario 1: 100% of the project's area of coverage; Scenario 2: 50% of the areas covered in a 2-year period, 50% per year–800,000 ha; Scenario 3: 25% of the areas covered in a 2-year period, 50% per year–400,000 ha; Scenario 4: 10% of the areas covered in a 2-year period, 50% per year–160,000 ha.
[24] PDF–Soils with degraded fertility.

bovine arroba, all projections for livestock production become attractive (Table 1). In the projections for Scenario 2, with partial investment in improvements, machinery and livestock, all projections present viability and financial attractiveness (Table 2). In both investment scenarios, the CLFI activities stand out due to the lower risk associated with price variation. The CLFI simple row 4x10–PDF presented more attractive returns than the 2x22–PDF spacing option, due to the higher income provided by the greater number of trees per area in the tenth planting year.

5. Both the crop–livestock integrated system (CLI) 3 and 4 areas–PDF presented economic viability in all scenarios. The CLI 3 areas model did not show attractiveness except in Scenario 1 of 100 percent of the investments combined with the 10 percent reduction in the sale price of the products. All projections are characterized by consistently positive cumulative cash flow.

6. In most cases, cattle producers will find it difficult to implement the CLI 4 areas—PDF because they will require greater managerial and technological capacity to absorb the risk associated with annual crops. The average cattle producer in Brazil would migrate to the CLI 3 areas—PDF model, planting corn or sorghum which would require fewer technological needs.

7. For all the projections, the expenditures for the recovery of RLs had little impact on the economic indicators. This shows that all the attractive projects could absorb the costs of environmental recovery.

Table 1. Financial projections for 20-year period under Scenario 1 with 100% of investments financed, in R$

Level	Description	Investment	NPV (20th year)	IRR Agriculture (%) 20th year	IRR Livestock (%) 20th year	IRR Forest (%) 20th year	IRR Global (%) 20th year	Payback (years)
I	Livestock–Degraded pasture recovery	5,153,935.05	-3,007,878.77	-	0.08%		0.08%	20
II	Livestock no-tillage	5,153,935.05	-2,750,590.39	-	0.79%	-	0.79%	20
	Livestock no-tillage	5,003,534.09	-2,394,724.48	-	1.58%	-	1.58%	19
III	CLI 3 areas–Livestock no-tillage	5,212,255.60	2,169,563.24	-0.81%	23.38%	-	11.87%	10
	CLI 4 areas–Livestock no-tillage	6,952,540.57	4,009,953.45	17.80%	9.65%	-	14.22%	9
IV	CLFI simple row 2x2–Livestock no-tillage	5,925,560.43	3,780,836.13	-1.15%	7.15%	25.07 %	13.08%	10
	CLFI simple row 4x10–Livestock no-tillage	5,940,079.86	7,1,128.33	-2.88%	0.59%	26.41 %	15.20%	10

Source: FIP Landscape Project, Financial and Economic Analysis Report.

Table 2. Financial projections for 20-year period under Scenario 2 with partial investments in improvements, machinery and livestock, in R$

Level	Description	Investment	NPV (20th year)	IRR Agriculture (%) 20th year	IRR Livestock (%) 20th year	IRR Forest (%) 20th year	IRR Global (%) 20th year	Payback (years)
I	Livestock–Degraded pasture recovery	3,006,171.54	1,188,727.06	-	13.13%	-	13.13%	8
II	Livestock no-tillage–PDA[25]	3,006,171.54	1,446,594.40	-	14.28%	-	14.28%	7
	Livestock no-tillage–PDF	2,889,944.60	1,803,667.57	-	16.27%	-	16.27%	6
III	CLI 3 areas–PDF	3,055,323.09	6,533,667.57	6.05%	63.84%	-	33.42%	3
	CLI 4 areas–PDF	4,622,504.60	8,837,236.41	30.40%	69.95%	-	37.04%	2
IV	CLFI simple row 2x22–PDF	3,938,178.06	9,958,375.39	-1.15%	96.31%	25.11%	39.05%	2
	CLFI simple row 4x10–PDF	3,952,697.48	19,705,703.04	14.82%	96.16%	27.76%	41.65%	3

Source: FIP Landscape Project, Financial and Economic Analysis Report.

8. For the macroeconomic analysis, results indicated that, from a private perspective, the proposed Project as a whole is perfectly viable: on the one hand, as verified in the analysis at property level, there is an incentive for its adoption by producers; from an aggregate standpoint, an internal rate of return (IRR) of less than 20 percent is perfectly acceptable in all the simulations.

9. From a social perspective, using shadow-prices, the IRRs for all scenarios indicated that the proposed Project is macro-economically feasible (Table 3). According to projections, an investment of US$25 million will have returns in terms of the benefits of sequestered carbon, considering the hypothesis that 12 percent of the proposed Project area will be implemented and valuing CO_2 at US$3/ton or 2.4 percent of the area if the value of CO_2 is US$15/ton. Conversely, in order to pay an investment of US$25[26] million, it would require an annual investment of US$3.17 million for 20 years discounted at an annual rate of 10 percent.

Table 3. Global NPV and IRR estimates for the Project by scenario.

Scenarios	Global NPV 7.5%	Global IRR
Scenario 1: 100% of the Project's area of coverage	R$ 10,792.68	39.0%
Scenario 2: 50% of the areas covered in a 2-year period	R$ 5,089.36	35.6%
Scenario 3: 25% of the areas covered in a 2-year period	R$ 2,544.68	35.6%
Scenario 4: 10% of the areas covered in a 2-year period	R$ 1,017.87	35.6%

Source: FIP Landscape Project, Financial and Economic Analysis Report.

[25] PDA–Pastures soils with high degradation.

[26] The economic analysis was prepared in September 2017, considering an investment of US$25 million or R$80 million. Since September 2017, the Brazilian currency was depreciated. The exchange rate effective on October 18, 2017 was R$3.17 per US$1.00. On July 11, 2018, the change rate was R$3.82 per US$1.00. Nevertheless, the overall conclusion of the economic analysis remains updated for an investment of US$21 million.

10. Non-quantified benefits. Because of the theoretical and technical limitations characteristic of environmental projects, various side effects can be generated and difficult to quantify, such as:

- The national image, through concrete demonstration of the political will to comply with the commitments made in the Paris Agreement;
- The proposed Project's impact on the preservation of water quality and availability, due to its indirect and direct effects on springs;
- Preservation of the affected biome's biodiversity;
- The "demonstration effect" to producers in general of environmentally correct and profitable practices; and
- The dissemination of conservation-oriented awareness among producers, even those who cannot be integrated in the proposed Project.

11. Leveraging funds from landholders. By helping landholders adopt low-carbon emission agricultural practices, the proposed Project has the potential to leverage significant additional funds.

12. Based on FIP: ABC Project preliminary results, the table below presents the resources invested by the Project and producers, results so far, and the amount producers' have also invested in their landholdings.

Number of producers supported through TA	1,616
FIP: ABC Project investment by producer for 2 years, including training materials, technical assistance and M&E	R$5,159.89
FIP: ABC total investment in landholder assistance	R$8,338,382.24
Total land area adopting ABC practices as result of the Project	76,551 hectares
FIP: ABC Project investment by hectare	R$108.92
Average producer's counterpart resources invested by hectare for 2 years (*)	R$1,100.00

(*) Source: monitoring reports; and SIA system.

13. The FIP: ABC Project resources leveraged significant matching funds, at a ratio of nearly 1:10, from the producers supported by the Project. Note that only 10 percent of these resources is from agricultural credit lines, while 90 percent is from their own financial resources.

14. Although technical assistance costs and counterpart resources vary depending on the landscape composition, history of land use, and potential for technical capacity building, in the similar-case scenario, the FIP: Landscape Project could leverage over R$100 million, or approximately US$28 million, in kind from landholders who will invest to adopt agricultural and restoration practices. This would represent a significant financial contribution to the proposed Project results and also contribute to the proposed Project sustainability.

15. To monitor the landholders' investments and results in the supported landholdings, the proposed

Project will adopt the Sustainability Indicators for Agroecosystems (SIA). The SIA includes economic indicators (farm investment and income, profitability and productivity), environmental indicators (water use, soil health, waste) and social indicators (employment, community involvement, health, safety). Field technicians will assist with SIA data collection.

16. Even though the proposed Project does not require counterpart funds, implementing entities will provide counterpart funds in-kind. These resources must be strictly applied to activities that contribute to the proposed Project. In addition, whenever possible, projects will collaborate directly with existing IBRD loans or other lending instruments with the states in the selected watershed.

17. Even though the proposed Project does not require counterpart funds, it will be monitored and reported during the proposed Project implementation. Retroactive counterpart funds may also be considered, insofar as the actions funded clearly contribute to the outputs and outcomes of the proposed Project, pending analysis and agreement by the implementing entities and approval by the Bank.

18. The table below presents the estimated counterpart funds by each implementing entity. It is expected that the FIP's US$21 million grant would leverage R$40.1 million, or approximately US$10.5 million, in counterpart funds from the proposed Project implementing entities.

Institutions	***Description***	***Annual Counterpart financing ($)***	***Counterpart Total ($) (4 years)***
Brazilian Forest Service (SFB)			
Staff	1 cadaster director + technical staff (part time) (20%)	R$259,517.33	R$1,038,069.32
Other costs	(1) IT investments, (2) SICAR systems, (3) travel expenses	R$20,000.00+20% of SICAR and IT costs	(1) R$3,950,000. + (2) R$ 9,085,000 + (3) R$ 80,000
Total (a)			R$14,153,069.32
Ministry of Agriculture, Livestock and Food Supply (MAPA)			
Staff	2 specialists (part time) (25%)	R$120,000.	R$480,000
Other costs	Travel expenses	R$100,000.	R$400,000
Total (b)			R$880,000
National Rural Learning Service (SENAR)			
Staff	3 administrative staff – Headquarters (full time)	R$540,000	R$2,160,000.
Other costs	18 local staff– Regional Offices (2 people–full time)	R$2,592,000	R$10,368,000
Total (c)			R$12,528,000
Brazilian Agricultural Research Corporation (EMBRAPA)			
Staff	1 coordinator+ technical staff+ trainers (part time)	R$1,926,962.74	R$7,707,850.96
Other costs	Regional Offices – Demonstration Units	R$940,044.16	R$3,760,176.64
Total (d)			R$11,468,027.65
Ministry of Science, Technology, Innovation and Communication (MCTIC) and National Institute for Space Research (INPE)			
Staff	(1) INPE 1 coordinator; technical staff (part time) (2) MCTIC – staff (part time)	R$219,375 R$73,125	R$819,000 + R$292,500
Total (e)			R$1,111,500

Institutions	*Description*	*Annual Counterpart financing ($)*	*Counterpart Total ($) (4 years)*
TOTAL (a+b+c+d+e)			**R$40,140,596.9**

ANNEX 5: PROJECT RELATIONSHIP WITH FIP INVESTMENT CRITERIA

Brazil
FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

REDD+ equivalent in Brazil

1. Brazil's National REDD+ Strategy is the outcome of a preparation process that involved ample participation from stakeholders between 2010 and 2015. From a strategic perspective, the main reference points for Brazil's REDD+ type actions are the National Plan on Climate Change and the National Policy on Climate Change (PNMC) Law enacted in 2009. It legally defines Brazil's commitment to reduce emissions, which could generate a reduction of 38.9 percent in projected emissions for 2020. In the context of the PNMC, the Ministry of Agriculture, Livestock and Food Supply (MAPA) developed the "Sectoral Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low-Carbon Emissions Agricultural Economy," also known as the ABC Plan. Its overall objective is to promote the reduction of GHG emissions and the increase of carbon sequestration in agriculture by improving efficiency in the use of natural resources, increasing the resilience of production systems, and enabling the agricultural sector's adaptation to climate change.

2. In 2015, the GoB announced at the United Nations Climate Conference in Paris (COP21) the country's Nationally Determined Contribution (NDC) to the global effort of mitigating climate change. The NDC includes a combined target of restoration (return of ecosystems as close as possible to the original "reference" ecosystem) and reforestation (any process that returns complete or partial tree cover on forest land through planting or natural or assisted regeneration processes) of 12 Mha, along with zero net emissions from land-use change, zero illegal deforestation, and other land-based targets by 2030. Moreover, in late 2016 the GoB committed to restoring 12 Mha of deforested land under the Bonn Challenge, a global effort to restore 150 Mha of the world's deforested and degraded lands by 2020, and 350 Mha by 2030. The Bonn Challenge is not a new global commitment but rather a practical means of realizing many existing international commitments, including the Convention on Biological Diversity (CBD) Aichi Target 15, the REDD+ goal, and the Rio+20 land degradation neutrality goal.

3. The GoB also plans to implement integrated crop, livestock and forestry initiatives on an additional five Mha under the country's low-carbon initiatives and restore five Mha of pastureland. Along with the 12 Mha under the Bonn Challenge, these pledges will be counted as part of the 20x20 Initiative, a regional platform to drive action on the Bonn Challenge led by the World Resources Institute (WRI). The NDC and Bonn goals reaffirm Brazil's various prior commitments and update others. Most of Brazil's targets are already included in existing laws, regulations and national plans.

4. In this context, the Brazil Investment Plan (BIP), endorsed by the FIP Subcommittee on May 18, 2012, is fully in line with the international and Brazilian frameworks on climate change.

Alignment with Country Investment Plan

5. The BIP complies with the FIP's four specific objectives. It was built on existing climate-change-related

policies and practices in Brazil and supports the instruments that guide federal and state financing policies in the land-use sector, thus overcoming key barriers to their implementation. As such, the BIP invests in replicable models that will catalyze transformational changes in the Cerrado Biome's land-use, forestry and agricultural sectors, generate new knowledge, and build the foundations to leverage additional financial resources in the context of an eventual future REDD+ mechanism under the UNFCCC.

6. The FIP–BIP adopts both the integrated landscape initiative (ILI) approach and a programmatic approach. These are defined as projects, programs, platforms, initiatives or sets of activities that seek to simultaneously improve food production, biodiversity or ecosystem conservation, and rural livelihoods; work at a landscape scale and include planning, policy and management, or support activities at this scale; involve inter-sectoral coordination or alignment of activities, policies or investments at the level of ministries, local government entities, farmer and community organizations, NGOs, donors, and/or the private sector; and are highly participatory and support adaptive, collaborative management within a social learning framework (Milder, Hart, Dobie, Minai and Zaleski 2014, 10).

7. The BIP's specific objectives are to improve environmental management in previously converted areas of the Cerrado Biome, and to produce and disseminate environmental information at the biome scale. As part of the BIP, the overall objective of this proposed Project is to promote the adoption of environmental conservation and restoration practices, and sustainable low-carbon emission agricultural practices in selected watersheds of the Cerrado Biome. It will be complementary and will scale up BIP results by supporting environmental regularization and low-carbon emission agricultural practices for landholders and traditional communities in selected watersheds.

8. The following six long-term outcomes are expected through the proposed Project implementation: (i) restoration and increase in pasture productivity in areas suitable for cattle ranching; (ii) restoration of the structure, function and ecosystem services of riparian forests located in the selected watersheds; (iii) enhancement of the biodiversity of degraded pastures and riparian areas, further contributing to the creation and enhancement of ecological corridor connectivity along the rivers; (iv) removal of CO_2 from the atmosphere by increasing carbon sequestration in riparian and RL forests; (v) improvement of soil and erosion control; and (vi) halting and reversal of land degradation processes by rural landholders, with special focus on riparian ecosystems.

Climate-change mitigation potential

9. The low-carbon emission agricultural practices and forest restoration practices promoted by the proposed Project have a proven effect on generating GHG emission reductions in the agricultural sector through soil carbon sequestration. This is particularly important for the Cerrado Biome, where soil organic carbon represents the most substantial carbon pool (estimated to account for up to 70 percent of total carbon stocks per hectare). Therefore, small changes in the Cerrado Biome's soil organic carbon pool could have dramatic impacts on the concentration of CO_2 in the atmosphere. Significant amounts of this carbon are emitted when forests are converted to cropland and pastures, while additional amounts are further released by the subsequent application of unsustainable land-management practices.

10. By increasing the adoption rate of low-carbon emission agricultural practices and the implementation of natural vegetation restoration practices in the Cerrado Biome, the proposed Project will make a direct contribution to carbon sequestration in this biome while also contributing to the stabilization of the agricultural

frontier through increased productivity gains in existing lands. Additional environmental benefits include nutrient cycling, rainfall regulation, improved water quality and flows, habitat provision, and river conservation.

11. Brazil's NDC Restoration and Reforestation Target study (2017[27]) recommends integrating restoration programs with actions for the agricultural sector to increase productivity.

Demonstration of potential scale

12. The proposed Project focuses on the selected watersheds, given their advanced stage of anthropization and the need to restore their natural vegetation. The proposed Project will mobilize local landholders and provide training and technical support to enable uptake and scale-up of land restoration practices and low-carbon emission agricultural technologies.

13. Therefore, the technical-assistance nature of the proposed Project will support the definition of tools and methodologies that can then be scaled up in the context of the landscape approach in the Cerrado Biome. The success of the proposed Project is expected to trigger similar initiatives in other Cerrado Biome watersheds**.**

Potential to generate co-benefits

Improvement in social and economic well-being

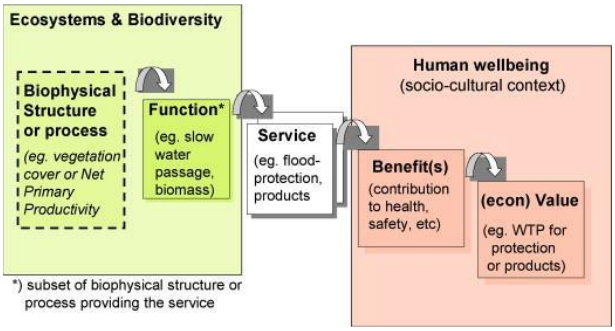
14. ILM is inherently people-centered and may, therefore, generate multiple outputs in a sustainable manner with the least trade-off costs and with maximized synergies. The landscape approach is the only way to ensure long-term (multi-generational) environmental change, landscape-scale restoration and/or improved land management.[28]

15. The proposed Project will bring benefits both for the government and for landholders. For landholders, the benefits include greater legal certainty: the ability to demonstrate environmental compliance; suspension of fines (in some cases); access to technical assistance for recovering degraded pastures and increasing productivity; input for better planning of a landholding's land use; use of up to half of RLs for economic benefits; and increase in cattle-ranch productivity. Productivity increases can sustain the economic performance of agriculture, even during a crisis.

16. In addition, the proposed Project is expected to increase job creation through the rural extension service[29] and more labor-intensive technologies, and to increase capacity and knowledge retained at the farmer level for the application of improved agricultural, land-use and management practices and production systems (i.e., ABC practices and APP and RL reforestation). A new "culture of restoration" would invigorate and strengthen local communities and give them a renewed sense of identity, purpose and place. The proposed Project will work closely with landholders and support their efforts to increase productivity in ways that are sustainable and protective of the environment, and that enable the rural poor to overcome poverty.

[27] Brazil's INDC Restoration and Reforestation Target–Analysis of INDC Land-Use Targets. World Bank, June 2017. Report No. AUS19554.
[28] Brazil's INDC Restoration and Reforestation Target–Analysis of INDC Land-Use Targets. World Bank, June 2017. Report No. AUS19554.
[29] The agricultural extension system provides advisory and support services that make farming activities more productive and environmentally friendly and help farmers to overcome poverty and/or improve their productivity.

17. As demonstrated by Groot et al., the figure below summarizes the framework for linking ecosystems to human well-being:[30]



Gender-Related Co-benefits

18. In the Cerrado Biome (as well as in the selected watersheds), women play a critical but often unrecognized role in the survival strategies and economy of poor rural households. Many women contribute to labor and generate income through agroforestry and animal husbandry activities. Most of the women's traditional production is often limited to marginal soils in rainfed agricultural systems that are highly susceptible to climate-change impacts; reliant on their traditional knowledge of biodiversity, non-timber forest products, seed varieties and drought-resistant species; and based on techniques of low-cost farming and land-management practices such as the use of compost, agroforestry, rotational grazing, or small-scale conservation tillage.

19. The proposed Project is expected to bring positive co-benefits for poor rural women and men. Women may particularly benefit because the proposed Project is expected to contribute to biodiversity conservation and enhancement, as well as to forest restoration and management. Women's traditional production may directly and largely benefit from these outcomes. When low-carbon pathways for agricultural development are implemented, the proposed Project is expected to encourage the participation of small farmers in low-carbon agriculture by making training venues, agricultural extension services, and credit accessible to them and, consequently, also to rural women who have experience with "climate-smart agriculture" that would no longer be neglected.

Protection of biodiversity

20. The Cerrado Biome has significant biodiversity and is one of Brazil's most endangered biomes. It covers nearly one quarter, or 200 Mha, of the country, with a mosaic of 23 types of vegetation composed of tropical savannas, woodlands, grasslands and forests. It covers a large area with significant carbon stocks and water resources, and with substantial biodiversity.

21. The Cerrado Biome is home to 935 species of birds and nearly 300 mammals, including such endangered species as the giant anteater (Myrmecophaga tridactyla), the jaguar (Panthera onca), the maned wolf (Chrysocyon brachyurus), and the pampas deer (Ozotoceros bezoarticus). The main co-benefits envisaged are: enhancement of the biodiversity of riparian areas and RLs; creation and enhancement of ecological corridor

[30] R.S. Groot, R. Alkemade, L. Braat, L. Hein, L. Willemen. 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. Ecological Complexity. Vol 7. Issue 3.

connectivity along rivers; enhanced biodiversity conservation through reduced loss of native vegetation cover in the selected areas; combined sustainable cattle ranching and farming with conservation of rural landscapes; improvement of soil and erosion control; and reduction of pressure for the conversion of native vegetation areas to agricultural use, thereby protecting existing biodiversity and ecosystem services. Moreover, biodiversity conservation in agricultural landscapes embraces all three elements of agricultural biodiversity defined by the Convention on Biological Diversity (2002): (i) genetic diversity of domesticated crops, animals, fish and trees; (ii) diversity of wild species on which agricultural production depends (such as wild pollinators, soil micro-organisms and predators of agricultural pests); and (iii) diversity of wild species and ecological communities that use agricultural landscapes as their habitat.

Strengthened resilience of ecosystems, with associated ecosystem services

22. As mentioned in the BIP, changes in the Cerrado Biome landscape have already increased wet-season river discharge (Costa et al. 2003:21). Pastures and crops have replaced the deep-rooted native vegetation that can tap water from deep soil layers (Oliveira et al. 2005:22; Ferreira et al. 2006:23). Regional CO2 and energy balances have also changed (Potter et al. 2009:24). Well-managed cultivated pastures may provide sufficient organic carbon to maintain soil carbon contents (Roscoe et al. 2001:25; Santos et al. 2004:26). However, most pastures are at an advanced stage of degradation and carbon inputs from degraded low-productive pastures may be too low to sustain the high soil-carbon storage under native Cerrado Biome vegetation (100 Mg C ha-1 per 100 cm soil depth).

23. In this context, the regeneration of degraded pastures and integrated crop–livestock–forestry management would contribute to the maintenance of natural ecosystems, together with their biodiversity and associated environmental services.

Financial Sustainability of Intended Results

24. The transformation of agricultural production from one of the greatest threats to global biodiversity and ecosystem services to a major contributor to ecosystem integrity is unquestionably a key challenge of the twenty-first century. Under this scenario, the use of land and its resources plays a fundamental role in delivering national economic growth in Brazil, and will continue to do so in the future. Agricultural business-sector leadership is imperative if Brazil is to continue its agricultural expansion and become more ecologically sustainable.

25. Incentives for increasing carbon stocks in vegetation, as provided by the Forest Code and the Low-Carbon Emissions Agriculture Plan, are a major impetus for a wide range of forest restoration interventions, as well as for the conservation of existing forests.

26. The proposed Project's results and institutional sustainability rely on the highly participatory approach followed in its preparation, the engagement of local producers' associations, producers' organizations and public authorities, and the strengthening of government institutions. By promoting an integrated landscape management approach that can be scaled up to cover a larger area, the proposed Project would demonstrate the relevance of convening multiple stakeholders within the landscape and fostering a convergence of understandings and objectives among them.

27. Furthermore, the proposed Project's sustainability will be found in the long-term financial and non-financial benefits to be achieved because of activities that the proposed Project will implement in selected watersheds:

- Land-use planning and the mainstreaming of environmental and low-carbon emission agricultural practices will be a tool for short-, medium-, and long-term decision making for all stakeholders involved.
- The ownership, implementation, and mainstreaming of the program across government institutions will make ILM an integral part of national land-use planning and development efforts.
- Environmental compliance certification will encourage farmers' and landowners' interest in investing in the medium- to long-term productivity of their landholdings.
- Rural extension and technical assistance will support the definition of tools and methodologies that can then be scaled up in the context of the landscape approach.
- Private-sector involvement will contribute to the sustainability of such investments, which are mutually beneficial to private-sector actors and local communities.
- Financial incentives in the form of livelihood benefits, cash for work, and access to natural resources will further sustain landholders' engagement during and beyond the proposed Project.
- Improvement and expansion of natural vegetation within private landholdings will ensure long-term provision of the ecosystem services (generating local, national and global environmental benefits) from such areas.

Safeguards

28. The proposed Project will assist landholders in implementing the Forest Code (Law 12.651/2012) and promote low-carbon emission agricultural technologies, the recovery of degraded pasture land, and the implementation of integrated crop–livestock–forestry systems under the Low-Carbon Emission Agricultural Plan (ABC Plan) in selected watersheds.

29. The proposed Project is expected to have an overall positive impact on the environment because it seeks to promote the protection of APPs and RLs, reforestation, recovery of degraded pastures, and reduction in the environmental impacts of agricultural activities mainly through rural extension activities. The agricultural and restoration practices to be promoted are more environmentally sustainable than conventional production practices. The proposed Project's expected benefits, which include better soil fertility, increased agricultural productivity and food security, greater availability and quality of water resources, reduced deforestation, enhanced biodiversity, and climate-change mitigation, will greatly outweigh the negative impacts likely to be generated. The proposed Project will adopt an integrated landscape approach aimed at sustainably managing land for multiple purposes and functions.

30. Potentially adverse environmental impacts are not expected because these will be avoided or minimized through appropriate preventive and mitigation measures. Therefore, the following environmental safeguards are triggered: Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Forests OP/BP 4.36; and Pest Management OP 4.09.

31. An Environmental and Social Management Framework (ESMF), including environmental social assessments, will provide guidance on potential issues that could arise during the proposed Project implementation. Periodic Bank supervision missions to the proposed Project will verify compliance with Bank safeguards and recommend corrective actions when applicable.

ANNEX 6: Brazil Investment Plan and Projects

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

Brazil Investment Plan (BIP)

1. The BIP seeks to promote sustainable land use and forest management improvement in the Cerrado Biome, the second-largest biome in Brazil and South America, and to contribute toward reducing pressure on the remaining forests, reducing GHG emissions, and increasing CO2 sequestration.

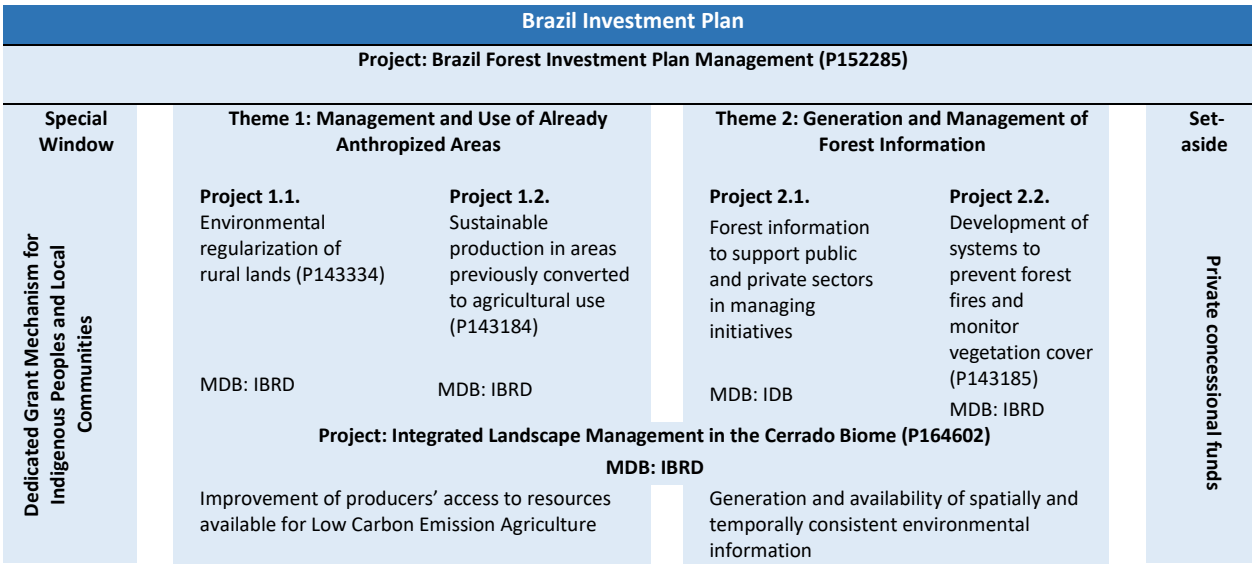
2. The Cerrado Biome is a strategic biome for economic and environmental reasons as well as for food security. It covers a large area with significant carbon stocks and water resources, and with substantial biodiversity.

3. The BIP comprises coordinated actions by three ministries (MMA, MCTI and MAPA). These actions are focused on building synergies to maximize the impact of a larger set of policies aimed at reducing deforestation in the Cerrado Biome by improving environmental management in areas previously anthropized, and by producing and disseminating environmental information at the biome scale. Therefore, it is essential to take these actions forward in a joint effort to avoid the conversion processes that could occur if command-and-control actions are not accompanied by incentives to promote sustainable productive activities.

4. The BIP comprises two projects with complementary approaches (forests and land use): (a) the generation and promotion of new, updated and accurate information on forest resources and their use, with the aim of assisting public- and private-sector policy makers and enabling the environment for forest management best practices that may contribute to valuing forest resources as an important socioeconomic and environmental asset; and (b) the generation of information on deforestation, forest degradation and land use in a systematic and ongoing manner, as well as the development of an early-warning system for preventing forest fires and a system for monitoring vegetation cover.

5. The BIP also proposes coordinated and synergistic actions by different actors in order to improve the sustainability and efficiency of forest resource management and land use in the Cerrado Biome, in particular on private landholdings which are prominent in this biome.

6. In addition, complementary contributions to the BIP include a Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (DGM) and a private-sector window specifically designed to promote private-sector investment in Brazil.



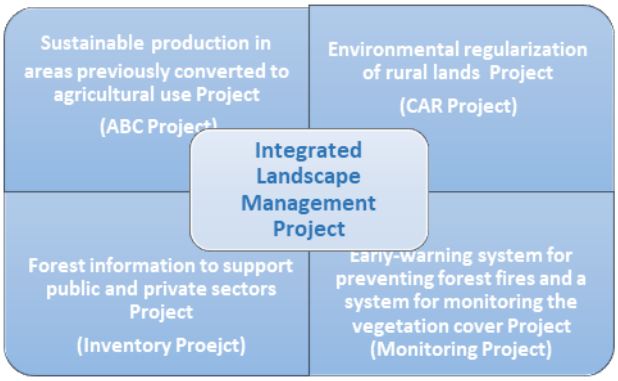
7. Project 1.1: Environmental regularization of rural lands (P143334), at an early stage of implementation, supports activities in 47 selected municipalities within the nine states and the Federal District. Project 1.2: Sustainable production in areas previously converted to agricultural use (under the Low-Carbon Emission Agricultural Plan; P143184), under implementation, aims to test and evaluate the effect of training activities and technical assistance on the adoption of low-carbon emission practices by participating rural producers in Brazil's Cerrado Biome.

8. Project 2.1: Forest information to support public and private sectors in managing initiatives focused on conservation and valuation of forest resources, under implementation, aims to implement the national forest inventory in the Cerrado Biome. This inventory will produce timely, good-quality information for public- and private-sector decision makers on forest resources and their use, thereby contributing to sustainable programs focused on the mitigation of GHG emissions in the Cerrado Biome. Project 2.2: Implementation of an early-warning system for preventing forest fires and a system for monitoring vegetation cover, under implementation, aims to manage all the data needed for associated projects, including a system to monitor plant-cover changes through remote sensing (in addition and complementary to a deforestation warning system) and a conceptual model for calculating GHG emissions from deforestation (high resolution).

9. Although these projects will be implemented in a complementary manner, each has its own pace, focus area and strategy. The BIP also includes a BIP Coordination Project (P152285) to coordinate projects and improve the sustainability and efficiency of forest resource management and land use in the Cerrado Biome.

10. The BIP Integrated Landscape Management (ILM) in the Cerrado Biome Project will be complementary to and scale up BIP results by supporting environmental regularization and low-carbon emission agricultural practices for landholders and traditional communities in 61 additional selected municipalities, promote landscape restoration, and enhance forest carbon stock in the Cerrado Biome's private rural landholdings.

11. The proposed Project will act in synergy with other BIP projects and contribute to the achievement of the objectives of the National Policy on Climate Change and the Plan to Prevent and Control Deforestation and Fires in the Cerrado. It will also ensure that rural properties assisted by the proposed Project are in environmental compliance with Brazilian Forest Code rules. The income of rural properties, especially those that raise dairy and beef cattle, are expected to increase (see figure below).



National Policies, Programs and Projects related to REDD+: Synergies and Financing

12. The BIP projects are included in broader policies and national plans which the GoB considers priorities. In parallel with the FIP, the GoB continues to support initiatives related to its national policies and plans through annual budget allocations and other international funds.

13. It is important to highlight the fact that the BIP was designed to enable the development of a strategic approach to promote synergies not only among its projects, but also with ongoing Cerrado Biome government plans and policies already under implementation at federal, state and municipal levels.

14. This section presents a summary of the government's strategy, programs and projects for the Cerrado Biome, their synergies, and financing sources that contribute to GHG emission reductions by reducing deforestation and forest degradation.

15. The following policies guide the Cerrado Biome approach as well as the proposed Project:

- Brazil's Nationally Determined Contribution (NDC), launched in 2015, calls for reducing GHG emissions by 37 percent below 2005 levels by 2025 and by 43 percent by 2030. The NDC includes a combined target of restoration and reforestation of 12 Mha (seven Mha of tree plantations plus five Mha of restoration), along with zero net emissions from land-use change, zero illegal deforestation, and other land-based targets by 2030. The NDC reaffirms the National Plan on Climate Change and the National Policy on Climate Change, Law 12.187/2009 (*Política Nacional de Mudanças Climáticas,* PNMC).

- Through the PNMC (Law 12.187/2009 and Decree 7.390/2010), the GoB made a voluntary commitment to reduce annual deforestation rates in the Cerrado Biome by 40 percent, based on average deforestation between 1999 and 2008.

- The Forest Code (Law 12.651/2012) requires landholders to ask their respective state environmental agency for prior authorization to use fire on vegetation in locations or regions whose characteristics justify its use in agro-pastoral or forestry practices. It also states that federal, state and municipal environmental agencies, which comprise the National Environmental System (*Sistema Nacional do Meio Ambiente,* SISNAMA), will update and deploy contingency plans for fighting forest fires, and that the Federal Government should establish a National Policy for Prevention and Control of Deforestation and Forest Fires.

- The National Policy for Recovery of Native Vegetation (PROVEG–Decree No. 8,972 dated January 23, 2017) aims to articulate, integrate and promote policies, programs and actions to foster the recovery of forests and other forms of native vegetation and boost the environmental regularization of Brazilian rural properties in at least 12 Mha by December 31, 2030.

- The aim of the Action Plan to Prevent and Control Deforestation in the Cerrado Biome (PPCerrado; Decree 5.577/2005) is to promote sustained reductions in deforestation and forest degradation rates, as well as in the incidence of burnings and forest fires in this biome.

16. The PPCerrado guidelines include: the integration and improvement of monitoring and control activities by federal agencies, aimed at the environmental regulation of rural landholdings; sustainable forest management and firefighting; land-use planning to conserve biodiversity, protection of water resources and encouragement of the sustainable use of natural resources; and the promotion of environmentally sustainable economic activities, maintenance of natural areas, and restoration of degraded lands.

17. MMA and World Bank are working in an integrated manner to avoid duplication, maximize synergies, and guide the resource-allocation activities that effectively contribute to the achievement of goals established in the PNMC, NDC, and PPCerrado.

ANNEX 7: Legal Framework

Brazil
FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

1. In 2015, Brazil submitted its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). Brazil is committed to reducing greenhouse gas (GHG) emissions by 37 percent below 2005 levels by 2025 and, as a subsequent indicative contribution, to reducing GHGs by 43 percent below 2005 levels by 2030. The Government of Brazil (GoB) is committed to the NDC's implementation, with full respect for human rights and the rights of vulnerable communities, indigenous peoples, traditional communities and workers in sectors affected by corresponding policies and plans, and is promoting gender-sensitive measures.[31] In this context, Cerrado Biome forests are important because of the substantial amount of carbon stored in their biomass and soils. The structural diversity of vegetation types in the Cerrado Biome involves a broad spectrum of total biomass amounts. The Brazil Investment Plan (BIP) estimates that organic matter includes up to 70 percent (185 tC/ha) of the total carbon stock. Therefore, changes in the Cerrado Biome's soil organic carbon pool can have significant impacts on CO_2 emissions.

2. Therefore, through its NDC, Brazil will seek to adopt consistent additional measures for the planet's climate balance. These measures will have a direct influence on integrated management of the Cerrado Biome landscape. Measures in the energy, forestry and land-use change, and agricultural sectors must be highlighted. Measures will also be taken in the energy sector to increase the share of sustainable bioenergy in the Brazilian energy matrix to approximately 18 percent by 2030, expand biofuel consumption, increase the supply of ethanol by increasing the share of advanced biofuels (second generation), and increase the share of biodiesel in the diesel blend. In the forestry and land-use change sector, measures are envisaged to strengthen compliance with the Forest Code at federal, state and municipal levels; restore and reforest 12 Mha of forest for multiple uses by 2030; and expand the scale of sustainable forest management systems through geo-referencing and traceability systems applicable to the management of native forests, in order to discourage illegal and unsustainable practices. In the agricultural sector, measures are aimed at strengthening the Low-Carbon Agricultural Plan (ABC Plan) as the main strategy for sustainable development in agriculture; promoting the restoration of 15 Mha of degraded pasture by 2030; and implementing an increase of five Mha of crop–livestock–forest integration (iLPF) systems by 2030.

3. The enforcement of the Native Vegetation Protection Law (Law No. 12.651/2012) is critical for achieving Brazil's NDC commitments.[32] Known as the "Forest Code," this law provides for the protection of native vegetation, establishes general rules on vegetation protection, Permanent Preservation Areas (Áreas de Preservação Permanente, APPs) and Legal Reserve (Reserva Legal, RL) areas. It also rules on forest exploitation, the supply of forest raw materials, control of the origin of forest products, and control and prevention of forest fires. It establishes economic and financial instruments to achieve these objectives. The following instruments are highlighted: the Rural Environmental Cadaster (Cadastro Rural

[31] http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf
[32] Brazil's NDC Restoration and Reforestation Target. Analysis of INDC land-use targets. World Bank. 2017. Report No. AUS19554.

Ambiental, CAR), Environmental Regularization Program (Programa de Regularizacão Ambiental, PRA), and Environmental Reserve Quotas (Cotas de Reserva Ambiental, CRA). The federal Executive Branch is authorized by the Forest Code (Federal Law 12.651/2012) to implement environmental preservation and restoration incentive and support programs and to adopt sustainable practices and green practices that reconcile forest and farming productivity, including the following categories: payment or incentive for environmental services; benefits for environmental conservancy actions; and incentives for trading, innovation and promotion of forest restoration, conservation and sustainable practices. To finance the necessary environmental regularization activities of the rural properties, the program must foresee the allocation of resources to scientific and technological research and rural extension related to the improvement of environmental quality.

4. The CRA, a tradable legal title for landowners with intact or regenerating native vegetation that exceeds the Forest Code requirement, may be used to offset the RL debt of another property within the same biome and, preferably, the same state. Implementing the CRA could create a market for forested lands, thus adding monetary value to native vegetation.

5. CAR is a national electronic registry that is used in conjunction with the responsible environmental agencies and as part of the National Environmental Information System (*Sistema Nacional de Informação sobre Meio Ambiente,* SINIMA). It is mandatory for all rural properties, with the purpose of integrating environmental information on all rural properties and landholdings and comprising a database for environmental and economic planning, monitoring and control, and combating deforestation. PRAs are used to fulfil legislation for the protection of native vegetation and other environmental regulations.

6. The recovery of RLs and APPs has great potential for carbon sequestration in Brazil. RLs are areas located within a delimited rural property or landholding that has the function of ensuring the sustainable economic use of the property's natural resources, aiding conservation and rehabilitation of ecological processes, promoting biodiversity conservation, and sheltering and protecting wildlife and native flora. They also serve as surplus natural forest areas used or traded to compensate for properties with forest liabilities. The APPs are established as protected areas, whether or not covered by native vegetation, with the environmental functions of preserving water resources, landscapes, geological stability and biodiversity; facilitating gene flow of flora and fauna; protecting soils; and ensuring the well-being of human populations. Considering the APP and RL areas that need to be recovered in accordance with current legislation, Brazil has a liability of approximately 21 Mha (SAE 2013). This liability is concentrated on the edges of the Amazon, along nearly the entire length of the Atlantic Rainforest, and in the southern portion of the Cerrado Biome where agricultural occupation is at its highest. The geographic regions with the highest environmental liabilities are: Amazon (eight Mha), Atlantic Forest (six Mha), and Cerrado Biome (five Mha).[33] It is estimated that the recovery of this environmental liability of 21 ± 0.6 Mha has the potential of sequestering one billion tons of carbon within 20 years, the period stipulated for the re-composition of RLs in accordance with the Forest Code (SAE 2013).

7. The Sectoral Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low-Carbon Economy, known as the ABC Plan (Decree No. 7,390/2010), also plays a critical role in the achievement of NDC commitments. The ABC Plan's aim is to promote the adoption of sustainable

[33] Considering only the APPs, there are 4.8 Mha of liabilities, distributed mainly in the Cerrado (≈1.7 Mha), Atlantic Forest (≈1.5 Mha), and Amazon (≈1 Mha).

production technology. With the objective of responding to the country's commitments to reduce GHG emissions in the agricultural sector (Ministry of Agriculture, Livestock and Supply [Ministério da Agricultura, Pecuária e Abastecimento, MAPA] 2017), the ABC Plan comprises eight programs, six of which relate to mitigation practices and one to climate-change adaptation. These eight programs and their targets for 2020 are: (a) Recovery of Degraded Pastures (15 Mha); (b) Agricultural–Livestock–Forest Integration (iLPF) and Agroforestry Systems (SAFs) (four Mha); (c) No-Till System (Sistema de Plantio Direto, SPD) (eight Mha); (d) Biological Nitrogen Fixation (BNF) (5.5 Mha); (e) Planted Forests (three Mha); (f) Animal Waste Treatment; (g) Land Use and Land Cover Mapping (4.4 million m^3); and (h) Climate-Change Adaptation. A credit line was created as part of the ABC Plan to assist in the process. Its aim is to motivate rural producers to invest in structuring a production system with practices that reduce GHG emissions from agriculture. Financing is offered for projects aimed at developing efforts to establish production systems based on the technological arrangements proposed by the ABC Plan, including the possibility of resources to recover APPs and RLs.[34] The use of this credit line increased from R$418 million in 2010–2011, to R$1.5 billion in 2011–2012, and to R$3 billion in 2012–2013 (or 88 percent of planned credit commitments). The average size of the loans is about R$230,000 for an average area of 105 ha.

8. The National Plan for the Recovery of Native Vegetation (Plano Nacional de Recuperação da Vegetação Nativa, PLANAVEG) is also critical. Established by Decree No. 8,972/2017, the plan's objective is to broaden and strengthen public policies, financial incentives, markets, agricultural best practices, and other measures necessary for the recovery of native vegetation in at least 12.5 Mha over the next 20 years. This recovery will occur in APP and RL areas as well as in degraded areas with low productivity. The goal of the first five years of implementation is the recovery of 390,000 ha of native vegetation. To reinforce the plan, the Federal Government issued Decree No. 8.972, dated January 23, 2017, which established the National Policy for the Recovery of Native Vegetation (Política Nacional de Recuperação da Vegetação Nativa, PROVEG), whose objectives are to articulate, integrate and promote policies, programs and actions aimed at inducing the recovery of forests and other forms of native vegetation, and to promote the environmental regularization of Brazilian rural properties under Law No. 12.651 dated May 25, 2012, in a total area of at least 12 Mha, by December 31, 2030. PROVEG's Article 4 established guidelines on promoting adaptation to climate change and the mitigation of its effects; preventing natural disasters; water resources protection and soil conservation; encouraging the conservation and restoration of biodiversity and ecosystem services; encouraging the recovery of APPs, RLs and Areas of Restricted Use; and promoting the recovery of native vegetation with economic and social benefits.

Theme	Legal framework	Description
Climate Change and Low-Carbon Agriculture	Law No. 12,187, dated December 29, 2009	Institutes the National Policy on Climate Change (PNMC).
	Decree No. 7,390, dated December 9, 2010.	Regulates arts. 6, 11 and 12 of Law No. 12,187, dated December 29, 2009, which establishes the PNMC.
Control of Deforestation and Environmental Regularization of Rural	Decree of September 15, 2010	Establishes the Action Plan for the Prevention and Control of Deforestation and Burnings in the Cerrado Biome (PPCerrado).
	Law No. 12.651, dated May 25, 2012 (Forest Code)	Provides for the protection of native vegetation, establishes general rules on vegetation protection, APP and RL areas; forest use and the supply of forest raw materials; control of the origin of forest products; control and prevention of forest fires; and provides economic and

[34] 3rd National Communication of Brazil to the United Nations Framework Convention on Climate Change (Brazil 2016). http://sirene.mcti.gov.br/documents/1686653/1706227/Estimativa+1ed.pdf/64d58e8a-1bc8-4fa6-aa5c-1d23dfeb9020

Property		financial instruments to achieve these objectives.
	Decree No. 7.830, dated October 17, 2012	Provides for the Rural Environmental Registry System and the Rural Environmental Registry; establishes general rules for the Environmental Regularization Programs (PRA) as specified in Law 12.651, dated May 25, 2012; and makes other provisions.
	Decree No. 8,235, dated May 5, 2014	Establishes general rules complementary to the Environmental Regularization Programs of the states and the Federal District, as specified in Decree No. 7.830, dated October 17, 2012, establishing the *Mais Ambiente Brasil* Program; and provides other measures
	Decree No. 8,972, dated January 23, 2017	Institutes the National Policy for the Recovery of Native Vegetation.
Technical Assistance and Rural Extension	Law No. 12.188, dated January 11, 2010	Establishes the National Policy for Technical Assistance and Rural Extension for Family Agriculture and Agrarian Reform (PNATER) and the National Program for Technical Assistance and Rural Extension in Family Agriculture and Agrarian Reform (PRONATER).

ANNEX 8: Principles for Integrated Landscape Approach

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

1. The terms "landscape approach" and "integrated landscape management (ILM)" are often used interchangeably. They seek to provide tools and concepts for allocating and managing land in order to achieve social, economic and environmental objectives (Minan et al. 2015). Along these same lines, Metzger and Brancalion (2013) argue that ILM not only allows for a better balance between native and human-dominated areas, but can also define and impose a new landscape configuration that makes it possible to take maximum advantage of the services that landscapes can provide, whether these are targeted to agricultural production, biodiversity conservation, provision of regulation services, or a combination of these services. Sayer et al. (2012) identified principles to guide the decision-making process in landscape contexts. The main elements are:

- **Ongoing learning, adaptive management, and resilience**. Because landscape processes are dynamic and complex, they require ongoing learning, reflection and adjustments. Wholesale unplanned system changes are usually detrimental and undesirable. System-level resilience can be increased through an active recognition of threats and vulnerabilities.

- **Multiple stakeholders and common-concern entry point.** All stakeholders should be recognized, even though an efficient pursuit of negotiated solutions may involve only a subset of stakeholders. Solutions should encompass a fair distribution of benefits and incentives. The various stakeholders in a landscape may have conflicting interests. Launching the process by focusing on easy-to-reach intermediate targets may provide a basis for stakeholders to begin to work together.

- **Multiple scales and multi-functionality.** Landscapes and their components have multiple uses and purposes, each of which is valued in different ways by different stakeholders. Trade-offs exist among the differing landscape uses and need to be reconciled. Landscapes provide multiple goods and services to agriculture, biodiversity, livelihoods, conservation and climate change. Outcomes at any scale are shaped by processes operating at other scales. An awareness of these higher- and lower-level processes can improve local interventions, inform higher-level policies and governance, and help coordinate administrative entities.

- **Clarification of rights and responsibilities.** Rules on resource access and land use shape social and conservation outcomes and need to be clear as a basis for good management.

- **Negotiated and transparent change logic.** The need to coordinate the activities of diverse actors requires agreement on a shared vision. This requires broad consensus on general goals, challenges, and concerns, as well as on options and opportunities. Transparency is aided by good governance.

- **Participatory and user-friendly monitoring.** Spatial plans must be developed and implemented based on an analysis of the land's status and potential and on the needs and wishes of the human

population, while balancing the importance of conservation and environmental service provision. To facilitate shared learning, information needs to be widely accessible. Systems that integrate different kinds of information need to be developed, ongoing monitoring and learning need to be leveraged, and adjustments need to be made as the integrated management process progresses.

- **Strengthened stakeholder capacity.** The complex and changing nature of landscape processes requires competent and effective representation and institutions that can engage with all the issues raised by the process.

- **Integrated landscape initiatives are likely to have certain start-up costs** as well as ongoing, long-term process costs.

ANNEX 9: Gender Action Plan

Brazil

FIP: Brazil Investment Plan: Integrated Landscape Management in the Cerrado Biome Project

Context

1. During the past 20 years, Brazil has experienced significant improvements along several dimensions of gender equality. Challenges remain in terms of women's access to economic opportunities, particularly in rural settings. In the agricultural sector, gender inequalities in access to and control over resources are persistent. Compared to men, women farmers face many disadvantages. They have lower access to tangible assets and credit than men. Due to traditional cultural norms and division of labor within the household, women have lower mobility and available time than men to participate in learning events and producers' organizations. Their insufficient access to information, technical assistance and extension services hampers their ability to learn about innovative and productive practices. Furthermore, women's participation in agriculture is often difficult to measure because agricultural data are usually collected at the farm level, and only the gender of the "principal farmer" is usually reported.

Objectives

2. By focusing on capacity-building and extension services activities that foster opportunities to access credit lines and apply low-carbon agricultural technologies, the proposed Project can contribute toward addressing some of the key challenges that hinder gender equity in the Cerrado Biome, because it includes a set of activities that the literature considers critical to overcoming gender inequalities and empowering women. These activities are related to the proposed Project's communication strategy; the preparation of Action Plans for integrated landscape management in selected watersheds; the proposed Project's training and capacity-building activities; and its technical assistance and extension services.

Activities

3. The following activities are envisaged to achieve this objective:

Key Challenges to Promote Gender Equity in the Agricultural and Forest Sectors	Project Instrument	Measures that will be Taken
Women's opportunities are constrained by insufficient information and knowledge about technological innovations and public policies	Communication Strategy	The Project communication strategy will take the appropriate steps to inform women in the selected watersheds about Project activities. The proposed Project will target communication activities to include venues that women producers and/or female-headed landholdings frequent or have access to.
Women's opportunities are constrained because most public institutions and implementing entities do not involve men and women equally in the design, implementation, management, monitoring, and evaluation of policies or projects	Watershed Action Plans for Integrated Landscape Management	The socioeconomic diagnostic of the watershed will incorporate a gender lens: assessing the differences in men's and women's development needs and preferences; their differences in access to and control over resources; and the potential distributive impacts of a development intervention on women and men. The process of preparing the "watershed action plans" will promote the participation of both men and women in preparation meetings and workshops. The organization of planning workshops will consider women producers and/or female-headed

		landholdings' time and their spatial and security constraints to participate. These planning workshops will be planned and carried out at times and in places that are well aligned with women's needs, productive tasks, and domestic and family responsibilities to promote their more active participation
Time, transportation and safety constraints, as well as cultural reservations, can hinder women from participating in training, capacity-building, and extension activities.	Training and Capacity Building	Training and capacity-building events will seek the enrollment of both men and women. These events will be organized at times and in places that are well aligned with women's needs to ensure their enrollment and participation.
Extension services for women remain rare, and where they are available, women often tend to make less use of them than do men. Extension service agents tend to approach male farmers more often than female farmers because of the general misconception that women do not farm and that extension advice will eventually "trickle down" from the male household head to other members. The way in which extension services are delivered can also prevent women farmers from receiving information on innovations.	Extension Services	Technical assistance and extension services will include targets related to the share of farms owned by women to receive visits from extension service agents and the share of women producers and/or female-headed landholdings to receive orientation.

Monitoring and Evaluation

4. The implementation of this Gender Action Plan will be monitored and evaluated according to the following gender-sensitive outcome and result indicators.

Outcome Indicators

- Share of female-headed landholdings and/or women producers enrolled in training and capacity-building activities provided by the Project.
- Share of female-headed landholdings and/or women producers concluding training and capacity-building activities provided by the Project.
- Share of female-headed landholdings and/or women producers who have access to extension services and/or have received visits from extension agents provided by the Project.
- Share of female-headed landholdings and/or women producers satisfied with access to and quality of extension services provided by the Project.

Results Indicators

- Share of farms owned by women and registered in CAR.
- Share of farms owned by women developing PRADs.
- Share of female-headed landholdings and/or women producers adopting new technology and/or new farming practices.
- Share of female-headed landholdings and/or women producers accessing the ABC credit line for the adoption of low-carbon agricultural technologies.

ANNEX 10: Project Site Selection

Brazil
Integrated Landscape Management in the Cerrado Biome Project