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Report No: PAD5150

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF USD 80.0 MILLION

TO THE

STATE OF MATO GROSSO

WITH THE GUARANTEE OF THE FEDERATIVE REPUBLIC OF BRAZIL

FOR A

MATO GROSSO SUSTAINABLE DEVELOPMENT OF FAMILY FARMING PROJECT

January 12, 2024

Agriculture and Food Global Practice
Latin America and Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective November 16, 2023)

Currency Unit =	Brazilian Reais
BRL4.97 =	US$1.00
BRL1.00 =	US$0.20

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Carlos Felipe Jaramillo
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ABBREVIATIONS AND ACRONYMS

APP	Areas of Permanent Preservation (*Áreas de Preservação Permanente*)
ATER	Technical Assistance and Rural Extension (Assistência Técnica e Extensão Rural)
CAR	Rural Environmental Cadaster (Cadastro Ambiental Rural)
CGJ	Mato Grosso General Comptroller of Justice Office (*Corregedoria-Geral da Justiça*)
CGE-MT	Mato Grosso State Internal Control Agency (*Controladoria Geral do Estado de Mato Grosso*)
CPF	Country Partnership Framework
CSA	Climate-smart Agriculture
EMPAER	State Research, Assistance and Rural Extension Company of Mato Grosso (*Empresa Mato-Grossense de Pesquisa, Assietência e Extensão Rural*)
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Analysis
ESMF	Environmental and Social Management Framework
ESS	Environmental and Social Standards
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoB	Government of Brazil
GRM	Grievance Redress Mechanism
GVA	Gross Value Added
INCRA	National Institute of Land Reform (*Instituto Nacional de Colonização e Reforma Agrária*)
INDEA	State Food Safety Agency of Mato Grosso (*Instituto de Defensa Agropecuária de Mato Grosso*)
INTERMAT	Land Institute of Mato Grosso (*Instituto de Terras de Mato Grosso*)
IPF	Investment Project Financing
LMP	Labor Management Procedures
M&E	Monitoring and Evaluation
NGER	Strategic Management Nucleus for Results (*Núcleo de Gestão Estratégica para Resultados*)
PAD	Project Appraisal Document
PCI	Produce, Conserve and Include Strategy
PDO	Project Development Objective
PIQCT	Indigenous Peoples, *Quilombolas*, and other Traditional Communities (*Povos Indígenas, Quilombolas e outras comunidades tradicionais*)
PEAF-MT	Mato Grosso Policy and Plan for Sustainable Rural Development of Family Agriculture (*Plano Estadual da Agricultura Familiar*)
PMU	Project Management Unit
PO	Producer Organization
POM	Project Operational Manual
PPCDIF MT	Mato Grosso's Action Plan for the Prevention and Control of Deforestation and Forest Fires *(Plano de Ação para Prevenção e Controle do Desmatamento e Incêndios Florestais no Estado de Mato Grosso)*
PPSD	Project Procurement Strategy for Development
PRA	Environmental Regularization Program (*Programa de Regularização Ambiental*)
PRADA	Project for Degraded and Altered Areas (*Programa de Recomposição de Áreas degradadas ou alteradas*)
SEAF	State Secretary for Family Agriculture of Mato Grosso (*Secretaria de Agricultura Familiar de Mato Grosso*)
SEFAZ	State Department of Finance of Mato Grosso (*Secretaria de Estado de Fazenda*)

SEMA	Mato Grosso Secretariat for the Environment (*Secretaria de Estado de Meio Ambiente*)
SENAR	National Rural Extension Service (*Serviço Nacional de Extensão Rural*)
SEP	Stakeholder Engagement Plan
SIEAF	SEAF Social Indicator System (*Sistema de Indicador Social da Secretaria de Estado de Fazenda*)
SIMCAR	Mato Grosso Rural Environmental Cadastre System (*Sistema Mato-grossense de Cadastro Ambiental Rural*)
STEP	Systematic Tracking of Exchanges in Procurement
TAC	Terms of Conduct Adjustment
TCE-MT	State Court of Accounts of Mato Grosso (*Tribunal de Contas do Estado de Mato Grosso*)

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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Brazil	Mato Grosso Sustainable Development of Family Farming		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P175723	Investment Project Financing (IPF)	Substantial	

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] 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
[ ] Alternative Procurement Arrangements (APA)	[ ] Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
05-Feb-2024	15-May-2030
Bank/IFC Collaboration	
No	

Proposed Development Objective(s)

To improve the access to markets, climate resilience, and land and environmental management of selected family farmers in the State of Mato Grosso and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

Components

Component Name	Cost (US$)
Component 1: Climate-smart economic inclusion	61,000,000.00
Component 2: Improved land and environmental management	20,000,000.00
Component 3: Project management and coordination	19,000,000.00
Component 4: Contingency Emergency Response Component	0.00

Organizations

Borrower: State of Mato Grosso
Implementing Agency: State Secretariat for Family Agriculture (SEAF)

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)? No

Is this project Private Capital Enabling (PCE)? No

SUMMARY

Total Operation Cost	**100.00**
Total Financing	**100.00**
of which IBRD/IDA	**80.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	80.00

Non-World Bank Group Financing

Counterpart Funding	20.00
Borrower/Recipient	20.00

Expected Disbursements (US$, Millions)

WB Fiscal Year	2024	2025	2026	2027	2028	2029	2030
Annual	0.00	21.00	28.00	15.50	10.00	4.50	1.00
Cumulative	0.00	21.00	49.00	64.50	74.50	79.00	80.00

PRACTICE AREA(S)

Practice Area (Lead)

Agriculture and Food

Contributing Practice Areas

Climate Change

CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

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

POLICY 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

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description
Schedule 2, Section I, A, 1(b): The Borrower shall establish and thereafter maintain, at all times during the implementation of the Project, a Project Management Unit ("PMU") in SEAF to assist in Project management and implementation, with staffing, functions and responsibilities acceptable to the Bank, as set forth in the POM.
Schedule 2, Section I, A, 1(c): The Borrower shall without limitation to the provisions of paragraph (b) of this Section A.1, and not later than ninety days (90) days after the Effective Date, complete the staffing of the PMU as set forth in the POM.
Schedule 2, Section I, A, 1(d): The Borrower shall not later than ninety (90) days after the Effective Date, establish and thereafter maintain throughout Project implementation, a Consultative Committee chaired by SEAF, and composed by representatives of all entities involved in Project implementation, with responsibilities and sufficient resources, all acceptable to the Bank and set forth in the POM.
Schedule 2, Section I, A, 1(e): The Borrower shall not later than ninety (90) days after the Effective Date, establish a Special Bidding Committee with composition, functions and responsibilities satisfactory to the Bank, as set forth in the POM.
Schedule 2, Section I, B, 1: The Borrower shall promptly after the Effective Date, enter into an agreement each with INTERMAT (the "INTERMAT Cooperation Agreement"); SEMA (the "SEMA Cooperation Agreement"), and CGJ-MT (the "" CGJ-MT Cooperation Agreement), and collectively the Cooperation Agreements, under terms and conditions acceptable to the Bank.
Schedule 2, Section I, B, 2: The Borrower shall enter into an agreement with the Procurement Agent (the "Procurement Agent Agreement"), under terms and conditions acceptable to the Bank.
Schedule 2, Section I, C, 1: The Borrower shall carry out the Project in accordance with a Project Operations Manual containing detailed guidelines and procedures for the implementation of the Project.
Schedule 2, Section I, D, 1: For purposes of carrying out Part 1.2 of the Project, upon the approval of a Subproject to be partially financed by a Matching Grant, and prior to the carrying out of any activities of the Subproject, the Borrower shall, transfer on a grant basis, part of the proceeds of the Loan to the corresponding Eligible Commercial Family Farming PO or Eligible Emerging Family Farming PO ("Matching Grant"), pursuant to the terms of an agreement to be entered between the Borrower and the Eligible Commercial Family Farming PO or Emerging Family Farming PO, under terms and conditions acceptable to the Bank (the "Subproject Agreement").

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Condition-1	Section 5.01(a): the Project Operations Manual has been adopted in form and substance satisfactory to the Bank.	IBRD/IDA
Effectiveness	Condition-2	Section 5.01(b): the Borrower has established the Project Management	IBRD/IDA

		Unit in form and substance satisfactory to the Bank.	
Effectiveness	Condition-3	Section 5.01(c): the Procurement Agent Agreement has been signed on behalf of the Borrower, and the Procurement Agent and all conditions precedent to its effectiveness (other than the Effectiveness of this Agreement) have been fulfilled, in a manner and with contents acceptable to the Bank.	IBRD/IDA
Disbursement	Condition-4	Schedule 2, Section III, B, 1(b): Notwithstanding the provisions of Schedule 2, Section III, A, no withdrawal shall be made for Eligible Expenditures under Part 2 of the Project under Category (2) until the INTERMAT Cooperation Agreement, the SEMA Cooperation Agreement and the CGJ-MT Cooperation Agreement have been entered into in form and substance satisfactory to the Bank.	IBRD/IDA
Disbursement	Condition-5	Schedule 2, Section III, B, 1(c): Notwithstanding the provisions of Schedule 2, Section III, A, no withdrawal shall be made for Emergency Expenditures under Category (3), unless and until all of the following conditions have been met in respect of said expenditures: (i) (A) the Borrower has determined	IBRD/IDA

		that an Eligible Crisis or Emergency has occurred, and has furnished to the Bank a request to withdraw Loan amounts under Category (3)]; and (B) the Bank has agreed with such determination, accepted said request and notified the Borrower thereof; and (ii) the Borrower has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association.	

I. STRATEGIC CONTEXT

A. Country Context

1. **Brazil's economy continues to recover after negative growth in 2014-2019 and the drastic impact of COVID-19**. Growth rebounded to 5 percent in 2021 and 2.9 percent in 2022, propelled by a strong fiscal stimulus, a successful vaccination campaign, a favorable commodity market, and pent-up demand for services. In 2023, growth remains solid and is expected to reach 2.6 percent driven by strong agriculture and boosted consumptions from households and government due to the fiscal stimulus and transfers to low-income households. CPI-inflation slowed to 4.0 percent in July 2023 after a peak of 12.1 percent in April 2022. The current account deficit stood at 2.5 percent of GDP in the 12 months to July 2023, fully financed by net FDI inflows at 2.6 percent of GDP. International reserves stood at 17.3 percent of GDP (US$ 343.6 billion) in June 2023. After improvements in 2022, fiscal balances showed some signs of deterioration in 2023 as revenues moderated and social transfers increased. The 12-month primary surplus of the public sector stood at 0.24 percent of GDP in June 2023, down from 1.3 percent in 2022. Public debt increased to 73.6 percent of GDP in June 2023, from 72.9 percent in December 2022. In the medium term, the budgetary outlook is expected to be anchored by the new fiscal framework, which sets out to maintain a primary surplus from 2024 and stabilize debt by 2026.

2. **Poverty rates are estimated at 24.3 percent in 2022, on par with 2014 levels, after peaking at 28.4 percent in 2021**. The 2023 poverty outlook looks promising, as a real increase in minimum wages, a major overhaul of the Bolsa Familia cash transfer program, and the planned introduction of additional benefits for families with children are expected to drive poverty down further. Yet, Brazil remains one of the most unequal countries in the world, with a Gini coefficient of 0.53 in 2021 and striking inequalities across regions, but also within cities and between rural and urban areas. Female-headed households, Afro-Brazilians, and indigenous populations are overrepresented among the poor, as they face worse labor market outcomes and enduring wage gaps.

3. **Brazil faces significant climate change impacts compounded by deforestation and land degradation**. Climate change is altering temperature and rainfall patterns in the country, resulting in reduced water availability and extended droughts, and could push another 800,000 to 3 million Brazilians into extreme poverty as soon as 2030. Continued deforestation in the Amazon and Cerrado biomes remains a matter of urgency, as it has increased land-use emissions - the main source of greenhouse (GHG) emissions in Brazil. Strengthening resilience to climate change and protection of natural assets, especially in the key biomes of Brazil, are essential for environmentally sustainable economic growth.

4. **The Brazilian State of Mato Grosso[1] plays a significant role in the national economy of Brazil.** Mato Grosso, located in the Central Western part of the country, is Brazil's third largest State by area (903,357 km2) and home to about 3.6 million people (1.7 percent of the Brazilian population in 2021). In 2020, Mato Grosso's GDP growth was stable (0.1 percent year-on-year) compared with the sharp drops in 26 states plus the Federal District related to the pandemic. While Mato Grosso contributed only 2.3 percent to the national GDP in 2020, it contributed 13.5 percent of the national agriculture GDP; within Mato Grosso, agriculture accounted for 25.7 percent of State GDP in 2020.

[1] Referred as Mato Grosso henceforth in the text.

Mato Grosso's GDP-per-capita (as of 2020) is the third highest among all Brazilian States at BRL 50,663 (approximately USD 9,985).

5. **However, poverty and inequality within Mato Grosso persist**. Despite Mato Grosso's high GDP-per-capita, income inequalities remain a challenge. Rural areas in Mato Grosso record poverty levels nearly four times those of urban areas (27 percent versus 7 percent, respectively).[2] More than 50 percent of Mato Grosso's Gross Value Added (GVA) is concentrated in only 20 of its 141 municipalities (*Plano Estadual da Agricultura Familiar – PEAF-MT, 2017*). Income is concentrated in those municipalities which produce export commodities, notably in the Cerrado biome. Indigenous Peoples, *Quilombolas*, and other Traditional Communities (*Povos Indígenas, Quilombolas e outras comunidades tradicionais* – PIQCT) are highly present in poorer rural areas of Mato Grosso, which contain 87 Indigenous Lands (belonging to more than 44,000 indigenous peoples of different ethnicities), and 71 *Quilombola* communities.

B. Sectoral and Institutional Context

6. **Mato Grosso is a critical agricultural production and agribusiness hub for Brazil.** Brazil is a major agricultural producer and global food exporter, among the world's leaders in the production of soybeans, poultry, beef, cotton, corn, and orange juice. Altogether the agriculture sector (including livestock) accounts for about 8.4 percent of the country's GDP, 16.2 percent of total employment, and 40 percent of total exports.[3] Within Brazil, Mato Grosso is the number one State producer of cereals, legumes and oilseeds, accounting for 28 percent of national output of these products in 2019.[4] Soybeans and corn (largely for cattle feed) produced in Mato Grosso make up more than 90 percent of national output and utilized more than 15 million hectares for their production in the 2019/2020 harvest. Mato Grosso also leads the country in beef production with 1.2 million tons in 2018, and accounts for a significant share of national sugarcane and cotton production.[5] Altogether, Mato Grosso is the country's largest agriculture exporter, reaching US$ 16.6 billion in exports in 2019 or 17.3 percent of the total national agricultural exports.[6]

7. **Mato Grosso's agriculture sector is also tightly linked to national efforts to manage natural resources and reduce deforestation.** Mato Grosso is unique due to its coverage of three important ecological biomes: Amazon (rainforest), Cerrado (savannah) and Pantanal (wetland). The natural resources contained in these three biomes provide water cycling, pollination, habitats, and other critical ecosystem services throughout the country. These ecosystem services are at the same time critical inputs to agricultural production, and thus underpin the local rural economy as a direct source of income and employment in the food and agriculture sector.[7] Agriculture is also a historic driver of deforestation, which – mirroring national trends[8] – decreased in Mato Grosso from 11.8 thousand Km^2 in 2004 to 757 Km^2 in 2012 (a 94 percent reduction) but then increased to 2.3 thousand Km^2 in 2021 (a 199 percent

[2] PNUD Brasil 2013, Ipea e Fundação João Pinheiro. http://www.atlasbrasil.org.br/2013.
[3] World Bank Group. 2016. *Brazil Systematic Country Diagnostic*.
[4] Companhia Nacional de Abastecimento (CONAB) 2019.
[5] Instituto Mato-grossense de Economia Agropecuária (IMEA) 2018.
[6] Ministério do Desenvolvimento, Indústria, Comércio e Serviços (MDIC) 2019.
[7] World Bank Group. 2016. *Brazil Systematic Country Diagnostic.*
[8] Deforestation in Brazil has picked up considerably in the past years, reverting significant gains in the previous decade. Deforestation in the Legal Amazon region reduced dramatically from its peak of 27.8 thousand Km^2 in 2004 to 4.6 thousand Km^2 in 2012 (an 84 percent reduction). Since then, annual deforestation rates constantly increased, reaching 13.2 thousand Km^2 in 2021 (a 190 percent increase compared to 2012).

increase compared to 2012) (**Figure 1**)[9]. As shown in **Figure 2**, Mato Grosso also has the second largest cumulative deforestation rate among Legal Amazon States[10], with a total of 150.2 thousand Km^2 since 1988, just below the State of Pará with 166.6 thousand Km^2.[11]

Figure 1: Annual deforestation in Mato Grosso (Km2)

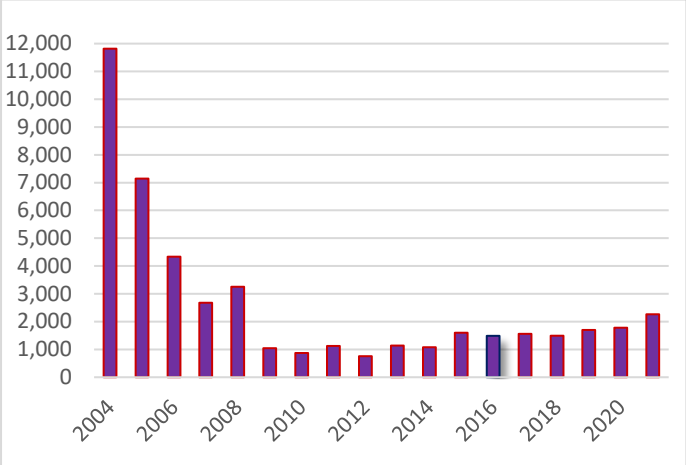
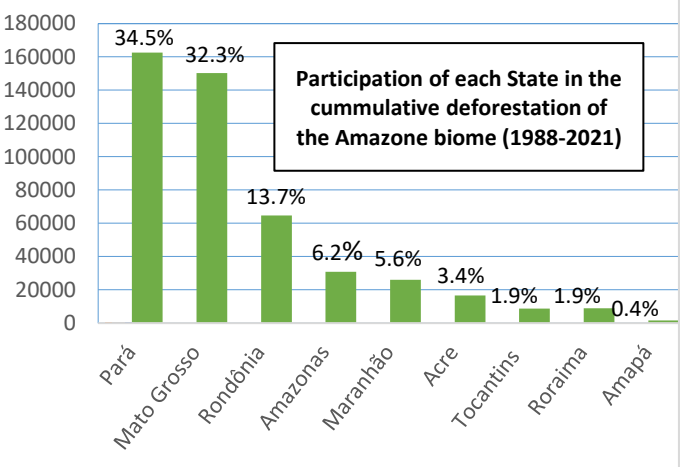


Figure 2: Cumulative deforestation per State (Km2)



8. **Mato Grosso's agriculture sector is also both vulnerable to climate change and a significant contributor to greenhouse gas (GHG) emissions**. Studies on the agriculture and livestock sectors estimate that Mato Grosso will experience increasing temperatures and decreasing precipitation over the next few decades.[12] A potential temperature increase is expected in Mato Grosso equal to or higher than 1 degree Celsius between 2021 and 2030, and another 2 degrees Celsius between 2031 and 2040, compared to 2011-2020. Precipitation reductions in Mato Grosso are estimated to be between 200 and 300 millimeters per year between 2021 and 2040 compared to 2011-2020, leading to a substantial increase in the soil hydric deficiency[13] in the same period and to reductions in soil coverage and agricultural and livestock productivity losses. Forest fires also pose a serious threat to agricultural production in Mato Grosso, jeopardizing Mato Grosso's natural capital base and forest-dependent – often PIQCT – livelihoods. In 2020, fires in the Pantanal raged across an estimated 7,861 square miles between January and August; the previous record was in 2005, when approximately 4,608 square miles burned in the biome during the same

[9] In the 9 municipalities in Mato Grosso with the largest areas deforested, the rates of deforestation increased. Almost all of these municipalities were in the Amazon. According to MAPBIOMAS (2021), the area deforested in these nine municipalities increased from 64,106 to 76,544 ha, or from 32 percent to 43 percent of total deforestation in Mato Grosso.

[10] Brazil's Legal Amazon is a designation that refers to all nine states of Brazil's Amazon basin. These are: seven states in the North (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins), most of Mato Grosso in the Center-West Region, and the western part of Maranhão in the Northeast Region.

[11] *PRODES – INPE*. Interim PRODES data is available for 2022 showing a significant reduction in deforestation in Mato Grosso (14%) and in the Legal Amazon States (11%). These numbers indicate a reverse of decades of annual increases in deforestation rates, arguably reflecting late correction in command-and-control efforts following strong international criticism.

[12] Existing and Future Climate Vulnerability for the Production of Soy, Corn, Cotton, and Beef in the State of Mato Grosso; EIRELI-ME, 2020.

[13] Hydric deficiency is the consequence of a continuous or transitory drought that impairs growth of plants due to the decrease of water potential, stomata conductance, photosynthesis, and assimilation of N by the plant.

period.[14] At the same time, agriculture is also a significant contributor to greenhouse gas emissions. At the national level, Brazil's agriculture sector (including livestock) accounts for slightly more than one third of total national GHG emissions. When combined with land-use change and forestry – largely driven by agriculture – the sector accounts for over 60 percent.[15] While emission intensities (or GHGs emitted per unit of product produced) vary widely within the agriculture sector, studies indicate that certain livestock systems in Brazil have higher emission intensities than the global average due to associated land use change, the extensive nature of pasture-based systems, and significant numbers of animals dedicated to breeding as opposed to production.[16] Given its leading role in the national agriculture sector and deforestation rates (see above paragraph), Mato Grosso is a significant contributor to such national agriculture sector emissions.

Figure 3: Gross Value Added by Municipality, in Mato Grosso, in 2017. Source: Seplan (2017).

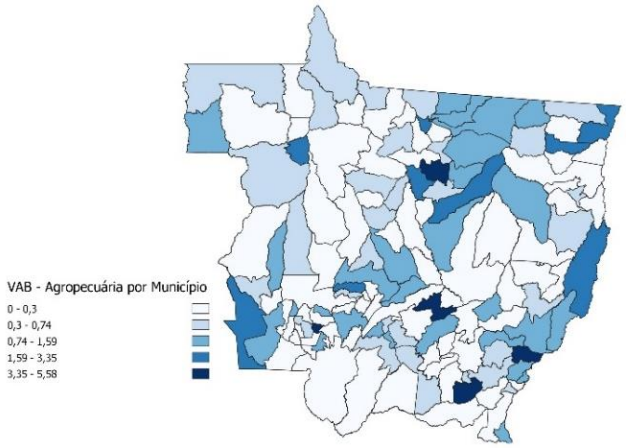
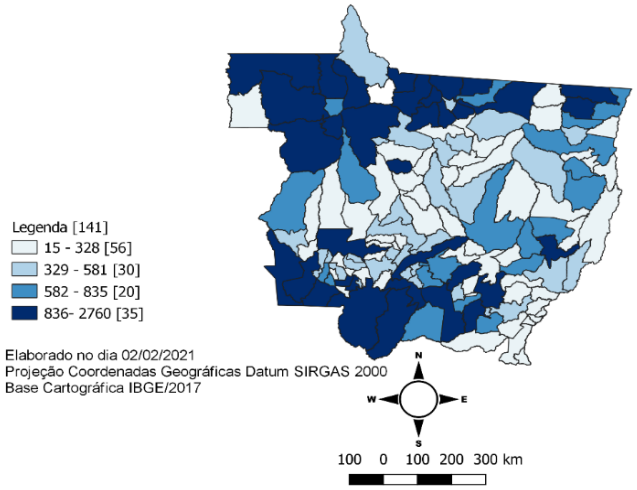


Figure 4: Geographical distribution of agricultural establishments of family farming in Mato Grosso.



9. **While agriculture and agribusiness in Mato Grosso are major providers of incomes and economic growth in the State, these benefits are concentrated in a limited number of municipalities that produce export commodities.** Agribusiness and primary production make up 50.5 percent of Mato Grosso's GDP, generating considerable foreign exchange and underpinning its economy. However, Mato Grosso's family farms confront significant inequalities in capturing economic and other livelihood benefits from the sector. In Brazil, "family farms" are defined according to Brazil's Farming Law (Law 11.326/2006).[17] Mato Grosso is estimated to contain 81,635 such family farms, which make

[14] According to an *analysis conducted by NASA for The New York Times*, based on a new system to track fires in real time using satellite data.

[15] According to SEEG, in 2020, Brazil's net GHG emissions were of 1.525 GtCO2e. Agriculture and livestock emitted a net 577 MtCO2e (or 38 percent of total GHG emissions), while land-use change and forest sector emitted 362 MtCO2e (combined, the sectors accounted for 61 percent of the total GHG emissions). *https://plataforma.seeg.eco.br/total_emission*. The latest official data available from the MCTIC's SIRENE in 2016 provides similar results (*https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/emissoes/emissoes-de-gee-por-setor-1*).

[16] Gerber et al. 2013. Tackling climate change through livestock - A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.

[17] Law 11.326 (2006) defines family farmers as follows: (i) does not have under any tenure regime an area of more than four fiscal modules; (ii) predominantly relies on its own family labor; (iii) household income predominantly originates in the family farm; and (iv) family members operate the farm.

up at minimum 69 percent of the total farms in the State, and likely more).[18] Family farmers operate in more than 15 production chains, with milk, cassava, fruit, honey, rubber, coffee, annatto, black pepper, handicrafts, and ecotourism among the most prominent. PIQCTs make up an estimated 1.1 percent of family farming populations as evidenced by records under Federal Law No. 2006 of Indigenous lands, *Quilombola* communities, and other designations such as Conservation Units that are beneficiaries of family farming public policies. Altogether, almost 30 percent of the state's territory is occupied by family, settled, and Indigenous farmers.[19] However, as shown in **Figures 3 and 4**, municipalities with low Gross Value Added (GVA) are also those where primarily family farmers, including PIQCTs, reside.

10. **Limited access to technologies, inputs, technical assistance, and financing limit family farming productivity and access to markets, as well as their ability to adapt to climate change.** According to data from the 2017 Agricultural Census for Family Agriculture, the use of basic agricultural technologies, such as limestone application and fertilization were carried out in only 11 percent and 18 percent of family farms, respectively, compared to 25 percent and 30 percent in non-family farms in Mato Grosso. Underlying these low rates is a limited access to inputs, technical assistance, and credit. Only 15 percent of family farms in Mato Grosso are estimated to practice mechanized agriculture, only 13 percent receive technical assistance services, and only 16 percent access rural credit, respectively, compared to 47 percent, 32 percent, and 20 percent of non-family farms in Mato Grosso.[20] As a consequence, family farmers are unable to adopt more sustainable and climate resilient practices, making them particularly vulnerable to the increasing impacts of climate change. Inefficient processes for the land and environmental regularization of their lands aggravates these problems, as many family farmers are unable to comply with the administrative demands of the financial and commercial systems (including difficulties in offering guarantees to financiers). As a result, family farmers are largely uncompetitive vis-à-vis the markets. Most family farmers are not linked to economic, productive, or commercial organizations such as cooperatives and associations. Only 20 percent of family farmers are estimated to participate in domestic markets, with many instead allocating a large portion of production for self-consumption and irregularly trading their surplus.

11. **Within the family farming populations, the leadership roles of women are particularly constrained.** The large majority of family farms in Brazil are run by men (86 percent), despite both male and female family farmers having similar levels of formal education and experience.[21] Mato Grosso shows similar numbers, with an estimated 82 percent of farms run by men.[22] Women-run family farms in Mato Grosso are around 30 percent smaller in size than male-run family farms. The main types of productive activities undertaken by women-run and male-run family farmers are similar, with cattle ranching and breeding comprising around 80 percent for both, followed by temporary crops. However, anecdotal evidence from the field shows that while women participate heavily in the on-farm labor critical to family farming initiatives, they do not often lead entrepreneurial initiatives or take leadership roles in family farming producer organizations (POs). Women leadership of family farming initiatives – as opposed to participation in farming as part of the household – is critical for improving women's voice and agency as leadership is linked to voting ability in decisions of POs. Women family farmers also have less access than men to agricultural extension, opportunities to participate in technical meetings and seminars, productive assets, producer associations, and markets. Female family farmers are accordingly overrepresented among lower income groups, including family farmers earning less than BRL 23,000 (approximately 4,500 USD) annually (62 percent of women family farmers, versus 48 percent of men) and

[18] Instituto Brasileiro de Geografia e Estatística (IBGE) 2017.
[19] Produce, Conserve, Include (PCI) 2021. *Why Mato Grosso*.
[20] Instituto Brasileiro de Geografia e Estatística (IBGE) 2017.
[21] Helfand et al. 2015.
[22] Instituto Brasileiro de Geografia e Estatística (IBGE) 2017.

subsistence farmers (36 percent of women family farmers, versus 26 percent of men).[23] These data show that women family farmers face worse economic conditions and employment opportunities than men, even with the most economically vulnerable groups.

12. **Family farmers also operate in a fragile base of natural resources, with agricultural expansion and unsustainable practices driving forest loss and jeopardizing the natural resources that underpin their agricultural production**. According to Mato Grosso's estimates, while family farms are generally characterized by a relatively favorable environmental performance, they are still responsible for an estimated 20 percent of total deforestation in the State. With support from the World Bank's Development Policy Lending (P164588) disbursed in 2020, Mato Grosso has significantly strengthened its capacity to combat deforestation and forest fires as prior actions included the enactment of a decree reestablishing Mato Grosso's Plan for Prevention and Control of Deforestation and Forest Fires (*Plano de Ação para Prevenção e Controle do Desmatamento e Incêndios Florestais no Estado de Mato Grosso – PPCDIF/MT*). The decree included several measures that enabled early warning systems and swift response.[24] However, due to poor coordination among federal agencies, Mato Grosso's measures have proven insufficient to properly address the size of the challenge. Given that commodity price increases are rekindling conflicts over land and natural resources, especially in Brazil's Amazon and Cerrado biomes, the country might face challenges in reducing deforestation to meet its climate and environmental commitments.[25]

13. **Critically, the ability of family farmers to access the finance they need to invest in more resilient and sustainable production models depends on land and environmental regularization, including registration in the Brazilian Forest Code.** Brazil's Native Vegetation Protection Law, known as the Brazilian Forest Code[26], obliges landholders to register their landholdings in the Rural Environmental Cadaster (C*adastro Ambiental Rural – CAR*), to maintain a percentage of private rural landholdings as native vegetation (Legal Reserves – *Reservas Legais*), and to maintain Areas of

[23] Instituto Brasileiro de Geografia e Estatística (IBGE) 2017.

[24] The new plan provided for (i) the creation of an integrated monitoring center (the first of its kind in Brazil) to monitor and control legal and illegal deforestation, timber extraction, the quality of water, air, and soil, and all the information regarding the licensing process for investments with environmental impact; (ii) replacement of the existing obsolete satellite monitoring system through the adoption of a state-of-the-art satellite system, in coordination with the National Institute for Spatial Research (INPE), providing information within 48 hours; (iii) training and capacity building of key operational partners, such as the Brazilian Institute of the Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA), Polícia Militar Ambiental and Delegacia de Meio Ambiente, and (iv) confiscation of machinery from deforested areas, preventing them to be reused in other areas.

[25] At the Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in 2021, Brazil reconfirmed its 2015 commitment to reduce GHGs, and announced an increased 50 percent reduction by 2030 based on 2005 levels (USDA 2022). Also, Brazil was a signatory of the Glasgow Leaders' Declaration on Forests and Land Use (*link*) and with other signatories, committed to working collectively to halt and reverse forest loss and land degradation by 2030. Furthermore, in its second NDC update in March of 2022, the Brazilian government decided to go beyond existing laws and policies and commit to eliminating illegal deforestation by 2028 (*link*).

[26] 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), 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 CAR. This registry contains details on the total area of individual farms, the areas earmarked for alternative land use, APPs and RLs. The percentage to be held as natural vegetation varies from 80 percent in the Amazon biome to 35 percent in the Cerrado biome within the 9 States that make up the "Legal Amazon", to 20 percent in the rest of Brazil. Once registered in the CAR, private landholders are required to resolve any environmental liabilities established by SEMA through the preparation and implementation of Environmental Regularization Programs (PRAs) and Projects for Degraded and Altered Areas (PRADAs).

Permanent Preservation (*Áreas de Preservação Permanente – APPs*) with minimum conservation standards. This represents a cornerstone of Brazil's approach to climate change mitigation and adaptation in the agriculture, forest, and land use sectors. However, on-farm compliance with the Forest Code depends significantly on regularization services provided by Land Administration institutes (from the executive and judiciary government branches) at State or Federal levels and the Secretariat for the Environment of each State. In the context of Mato Grosso, farmers without land titling by the Land Institute of Mato Grosso (*Instituto de Terras de Mato Grosso – INTERMAT*) and subsequent registration in the Forest Code compliance system (*Sistema Mato-Grossense de Cadastro Ambiental Rural – SIMCAR*[27]) of the State Secretariat for Environment (*Secretaria de Estado de Meio Ambiente* – SEMA) are not permitted to access public rural development programs, including credit programs such as the National Plan for Family Farming (*Programa Nacional de Fortalecimento da Agricultura Familiar – PRONAF).* Due to the high costs required to register land in the Forest Code, many family farmers remain unregistered, and thus without access to the financing that would enable them to invest in on-farm improvements. Such on-farm improvements include those that would enable compliance with the Forest Code and maximize the environmental and climate benefits of their production. This type of challenge is described in multiple reports of the Intergovernmental Panel on Climate Change (IPCC)[28] stating that insecure land tenure affects the ability of people, communities and organizations to make changes to land that can advance adaptation and mitigation outcomes.

14. **Family farmer compliance with the Brazilian Forest Code is further hindered by inefficiencies, lack of resources, and poor coordination among Mato Grosso's land and environmental regularization processes.** Inefficiencies and lack of resources within INTERMAT cause delays in the regularization of State-owned Settlements.[29] In addition, inefficient legal processes and coordination among judicial and executive powers constrains processes to resolve conflicts over land rights. Moreover, inefficiencies in the SIMCAR can leave administrative processes pending for long periods, especially for the Settlements which contain large concentrations of family farmers and small properties. Critically, surveys by the State Research, Assistance and Rural Extension Company of Mato Grosso (*Empresa Mato-Grossense de Pesquisa, Assistência e Extensão Rural – EMPAER*) show that even family farmers who are titled and registered in the SIMCAR often lack the technical knowledge and capacity to comply with the Code requirements in a way that also generates net financial benefits for their family farming livelihoods. This acts as a further deterrent to land and environmental regularization in Mato Grosso.

15. **Looking forward, increasing leadership among younger generations of family farmers is an important opportunity for innovation in on-farm sustainability.** The percentage of Brazil's population living in rural areas has shown a steady decline since the 1970s, with steeper declines for individuals under 29 years of age.[30] This trend is understood to stem from a lack of economic opportunities and improvement in social conditions in rural areas. Migration of rural youth to urban areas can create uncertainty regarding the survival of agricultural businesses and

[27] The Mato Grosso Rural Environmental Cadaster (*Sistema Mato-Grossense de Cadastro Ambiental Rural – SIMCAR*), adopted in 2017, aims at verifying whether properties comply with the Brazilian Forest Code. Following validation of property information by the State Secretariat for the Environment (SEMA) and if an environmental liability is detected, properties can enter a process of environmental regularization which entails a Terms of Conduct Adjustment (TAC) with the State Public Prosecutor (*Ministério Público do Estado*).

[28] Insecure land tenure affects the ability of people, communities and organizations to make changes to land that can advance adaptation and mitigation outcomes (*IPCC 2019*). The adoption of sustainable land management and poverty eradication can be enabled by improving access to markets, securing land tenure, factoring environmental costs into food, making payments for ecosystem services, and enhancing local and community collective action (*IPCC 2020*).

[29] The State Settlements are sets of agricultural units installed by Incra on a rural property. Each of these units, called plots or lots, is intended for a family of agriculturists or rural worker without the economic conditions to acquire a rural property. *Link*.

[30] Instituto Brasileiro de Geografia e Estatística (IBGE) 2010.

activities, potentially disincentivizing investment in sustainable production models with longer term payoffs. In fact, younger farmers have been shown to be more likely to adopt conservationist agricultural practices in particular, given the long time periods over which the investments are realized.[31] Literature has also shown that older farmers tend to be more resistant to the adoption of innovations, including in sustainable models of agriculture production, in the first place.[32] As the probability of non-succession appears to be related to the possibility of greater income in urban centers, increased leadership opportunities for youth in family farming is an important pathway toward addressing Mato Grosso's agri-environmental challenges.

16. **Mato Grosso has committed to an ambitious agenda for leveraging these family farming challenges and opportunities, as shown by a strong framework of strategies, policies, and plans.** Key among these are the 2015 Produce, Conserve and Include Strategy (PCI), Mato Grosso's 2018 Action Plan for the Prevention and Control of Deforestation and Forest Fires (*Plano de Ação para Prevenção e Controle do Desmatamento e Incêndios Florestais no Estado de Mato Grosso – PPCDIF MT*), and Mato Grosso's 2017 Policy for Sustainable Rural Development of Family Agriculture (*Plano Estadual da Agricultura Familiar – PEAF-MT*). The PCI Strategy aims to increase production while reducing deforestation, improving forest management, and reducing rural poverty and inequality. Specifically, PCI seeks to reduce deforestation in Mato Grosso's portions of the Amazon and Cerrado woodland by 90 and 95 percent respectively (compared to the 2001-10 annual average), regrow natural forests on 27 thousand square kilometers of land, eliminate illegal deforestation while continuing to increase the production of soy and cattle, and provide technical assistance to Mato Grosso's small-scale farmers by 2030. The PPCDIF MT aims to reduce deforestation and forest fires in Mato Grosso through command-and-control actions, territorial planning, and the promotion of sustainable activities. The PPCDIF MT is thus a key State instrument for contributing to the fulfillment of Mato Grosso's voluntary goal to reduce greenhouse gas emissions due to deforestation and forest degradation, in alignment with the goals set out in Brazil's National Policy on Climate Change. Finally, the PEAF-MT establishes priorities and action strategies for the Government, civil society, and the private sector for the sustainable development of family farming in Mato Grosso. Among the key priorities included in PEAF-MT are improving competitiveness, technical assistance, land and environmental regularization, and social control among family farming populations.

17. **This high-level policy framework in support to family farming has not yet been translated into investments.** Building on the priorities set out in the PCI, PPCDIF/MT, and PEAF-MT, the proposed project will invest in the development of family farming in a manner that helps to address the sustainability, climate change, and family farmer inclusion challenges facing Mato Grosso. This approach will complement other projects such as the Mato Grosso Fiscal Adjustment and Environmental Sustainability Development Policy Loan (P164588), which presents measures that focus primarily on the environmental issue of the large-scale agricultural sector (i.e. the 'Produce' and 'Conserve' axes of the PCI Strategy); the proposed project will focus on the 'Inclusion' axis as well, catalyzing investments that increase agriculture sector benefits for family farming populations while improving their sustainability and resilience to climate change.

C. Relevance to Higher Level Objectives

18. **The project will contribute to sustainable development and financial inclusion objectives as set out in the World Bank Group's Country Partnership Framework (CPF) for Brazil FY18–FY23[33] and to the implementation of key State strategies and plans.** Under CPF Focus Area 2 (Private Sector Investment and Productivity Growth), the project aims

[31] Kassie et al., 2009.
[32] Leonard et al. 2017.
[33] Report no. 113259-BR, discussed by the Executive Directors on July 13, 2017.

to improve family farmer access to credit by empowering their producer organizations to meet market requirement and reducing risks and costs associated with their businesses. Under CPF Focus Area 3 (Inclusive and Sustainable Development), the proposed project aims to contribute to the socioeconomic development of the rural poor and vulnerable groups through investments in climate resilient agricultural production, environmental compliance, and management and market access of local agrobusinesses. The project will also contribute to Mato Grosso's efforts to invest in the sustainable development of family farming, as set out in the 2015 Produce, Conserve and Include Strategy (PCI), Mato Grosso's 2018 Action Plan for the Prevention and Control of Deforestation and Forest Fires (PPCDIF MT), and Mato Grosso's 2017 Policy for Sustainable Rural Development of Family Agriculture and PEAF-MT).

19. **The project will support Brazil to achieve its Nationally Determined Contribution (NDC) and contribute to the country's climate change mitigation and adaptation efforts; the project is therefore consistent with Brazil's climate change strategies.** In the latest update (2022) to its 2015 original NDC[34], Brazil confirms its commitment to reduce emissions in 2025 by 37% compared with 2005, commits to reduce its emissions in 2030 by 50% compared with 2005, and sets a long-term objective to achieve climate neutrality by 2050. Agriculture and forestry sector mitigation priorities in the NDC include strengthening low-carbon agriculture approaches, restoring degraded pasturelands, enhancing integrated cropland-livestock-forestry systems, strengthening and enforcing the Forest Code, reaching zero illegal deforestation, restoring and reforesting forests, and enhancing sustainable forest management systems. The project is aligned with these mitigation priorities through its support for the adoption of low-carbon and climate resilient practices and technologies on family farms (component 1) and support for compliance with the Forest Code including through re-vegetation and afforestation on family farming areas (component 2). Regarding climate change adaptation, Brazil's NDC, referring to the second (2021) cycle of the National Adaptation Plan (NAP)[35], also cites the development of adaptation strategies in the agricultural sector with a view to ensuring food security and increasing crop and livestock productivity while adopting sustainable agriculture production methods. The priority adaptation actions it identifies include improving agricultural risk and vulnerability monitoring and diagnosing vulnerability to climate change of indigenous populations and lands. The project will contribute to these adaptation efforts through its support for improved monitoring and control of forest fires (component 2) and for climate vulnerability diagnostics for business plan activities targeting PIQCT communities (component 1). The project also responds to the agriculture sector priority interventions identified in the World Bank Country Climate and Development Report (CCDR) for Brazil.[36] These include scaling up climate-informed landscape management and efficiency gains in the livestock sector, which the project will contribute to under component 1 support to family farmers. The CCDR also prioritizes curbing deforestation and explicitly mentions accelerating registration and validation of CARs, which the project will support under component 2.

20. **The project will also contribute to climate change mitigation and adaptation objectives as expressed in the WBG Climate Change Action Plan 2021-25 and the WBG Roadmap for Climate Action in Latin America & the Caribbean.** The project will contribute to multiple agriculture sector priorities presented in the WBG Climate Change Action Plan: support for climate-smart agriculture (CSA) through the preparation and implementation of "Climate-smart Agriculture Family Business Plans" under component 1, de-risking private investment in sustainable agriculture value chains through utilizing the productive alliance approach under component 1, and supporting environmental management shifts that aim specifically to prevent and control deforestation and enhance ecosystem health ("Nature-based solutions") under component 2. These project activities also align with several areas for new WBG engagement

[34] *2022 (second) update to the Brazil NDC*.
[35] *Brazil 2021 National Adaptation Plan*.
[36] World Bank 2023. Brazil Country Climate and Development Report. *Link*.

aligned with government priorities identified specifically for Brazil in the WBG Roadmap for Climate Action in LAC: CSA (component 1), sustainable land management (Component 2), and protection of critical habitats (component 2).

21. **The project will also contribute to gender equity objectives as set out in the WBG Gender Strategy 2016-2023.** The project will contribute to the "Economic Opportunities" pillar of the WBG Gender Strategy. Through including gender equality criteria in the selection and preparation of Climate-smart Agriculture Family Farming Business Plans under component 1, the project aims to remove constraints to better livelihoods that women-led family farms face in Mato Grosso. Through including gender equality criteria in the land regularization activities under component 2, the project aims to help reduce barriers to women's ownership and control over land in the family farming sector.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

To improve the access to markets, climate resilience, and land and environmental management of selected family farmers in the State of Mato Grosso and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

PDO Level Indicators

Increase access to markets:
(i) Increase in gross value of sales by family farmers participating in approved subprojects (Percentage; disaggregated by PIQCT, women, youth)
Increase climate resilience:
(ii) Family farmers (members of supported organizations) adopting climate-smart agricultural practices and technologies[37] (Number; disaggregated by PIQCT, women, youth; to be included as CRI "Farmers adopting improved agricultural technology")
Improve land and environmental management:
(iii) Family farmers (members of supported organizations) benefited with improved environmental and land regularization services (Number; disaggregated by gender and PIQCT).

B. Project Components

22. **Strategic approach.** The proposed operation is an Investment Project Financing (IPF) with a total project cost of US$100.0 million to be implemented over a six-year period.[38] The total financing consists in an IBRD loan of US$80.0 million and counterpart funding from the State of Mato Grosso in the amount of US$20.0 million. The project approach strategically combines investments in family farming livelihoods (on-farm climate change adaptation and mitigation under component 1) with investments in institutional strengthening (land and environmental management under

[37] Climate-smart agricultural practices and technologies are defined as those that contribute to climate change resilience, including adaptation and mitigation approaches. See Box 1 for further details.
[38] To be aligned with Carta Consulta.

component 2), serving to improve both the competitiveness of Mato Grosso's family farming production in the shorter term and the institutional enabling environment for family farming in the longer term. The project will be implemented through four components (including a Contingency Emergency Response Component (CERC)) consisting of a mix of targeted technical assistance, tailored financial support to POs, and improved public services. The proposed project will benefit from the prior experience of the World Bank in Brazil and from lessons learned from operations with a similar nature elsewhere (see section E).

23. **Geographic focus.** The project's geographic and beneficiary targeting approach resulted in the identification of 61 municipalities (of Mato Grosso's total 141 municipalities) as eligible for project support for business plans under component 1. These municipalities were selected through a two-step process: (i) identification of those municipalities with the highest gross value for the major family farming production value chains,[39] the largest number of family farms, and the greatest estimated deficit in permanent preservation areas[40]); and (ii) a prioritization of those municipalities with the highest number of family farming POs (associations and cooperatives) actively engaged in the value chains. Under component 2, 35 of the State Settlements in Mato Grosso will be eligible for project support to improve land regularization and 11,000 families will benefit from environmental regularization. Given the interlinked nature of the activities proposed under components 1 and 2, the eligible municipalities are intended to overlap with the eligible Settlements such that beneficiaries may benefit under both components; critically, this will allow beneficiaries of component 1 to include aspects of land and environmental regularization in their business plans. The project's monitoring and evaluation approach will ensure against double counting of beneficiaries in these cases (See Annex 2 for more detail).

24. **Beneficiaries.** The direct project beneficiaries are an estimated **15,000** family farmers (of Mato Grosso's total 81,635 family farms, which make up at minimum 69 percent of the total farms in the State) and their respective POs participating under project components 1 and 2. These 15,000 direct beneficiaries include an estimated 9,000 participating under component 1 and an estimated 12,900 family farmers participating under component 2; an estimated 6,900 beneficiaries are expected to participate under both components. Beneficiary targeting under component 1 will aim to contribute to socioeconomic inclusion in two main ways. First, targets will be set for the number of business plans led by women, youth, and PIQCTs as well as for the overall participation of women, youth, and PIQCT beneficiaries across all windows. Second, to enable inclusion of diverse economic groups, two grant windows ("commercial" and "emerging") will be available under component 1 to finance business plans, each with conditions tailored to the needs of POs with different levels of organization, commercialization, and experience. Beneficiary targeting under component 2 will also contribute to inclusion of women through targeting a minimum portion of land regularization titles to be issued in the name of women. Indirect beneficiaries of the project include: (i) private agribusiness enterprises and government entities who may enter into partnerships with producers under component 1, and (ii) all family farmers (81,635 according to IBGE, 2017) and PIQCTs in Mato Grosso who will benefit from project activities to improve the State's extension services and increase the efficiency of environmental and land regularization services in Mato Grosso as a whole.

[39] These are: milk, fruits, horticulture, cassava, coffee, cacao, honey, and non-timber forest products. While all value chains will be eligible for project support (including non-agricultural activities such as artisanal craftwork and agro-eco-tourism, which are common in PIQCT communities), these eight were prioritized as part of the targeting approach due to their significance for family farmers and potential for generating benefits under the project for both family farming livelihoods and the environment. See Annex 2 for more detail.

[40] Permanent preservation areas under the Brazilian Forest Code are natural protected areas that farmers are required to delimit and maintain according to certain management standards.

Component 1 – Climate-smart economic inclusion: USD 61.0 million (USD 60.0 million IBRD, USD 1.0 million Government of Mato Grosso).

25. **The purpose of component 1 is to support the climate resilience of family farmers in Mato Grosso and improve their market linkages to sustain resilient production models over time**. All financing under this component will support CSA activities. This support will be provided through an adaptation of the "**productive alliance**" model[41] that aims to increase the adoption of CSA practices and technologies in the context of family farmers in Mato Grosso and the climate challenges and market opportunities they face. According to this adapted model, the productive alliance will consist of the following partners: (i) a group of family farmers formally constituted under a PO ("sellers") with the potential to provide a high-quality, agricultural product or service; (ii) "buyers" of said products or services who enter into a formal agreement with the sellers, ensuring the connection to markets and success of their business plans; (iii) providers of technical assistance services to support the design and implementation of business plans, including not only good business, management, and accounting practices but also the design and implementation of CSA approaches, environmental compliance with the CAR (see component 2), and attainment of environmental certifications; and, for those more commercially-oriented POs, (iv) a commercial financial institution, from which the PO may leverage business plan financing.

26. **Under this productive alliance approach, selected POs will participate in pre-investment activities (subcomponent 1.1) to develop business plans for the adoption of CSA practices and technologies under PO-level "CSA Family Farming Business Plans**." CSA practices and technologies are defined as those that contribute to climate change resilience, and/or climate change mitigation; indicative examples are presented in **Box 1**. The component will then provide matching grants (through Subproject Agreements) to support the implementation of approved CSA Family Farming Business Plans (subcomponent 1.2) by POs and their members. Approved business plans will need to demonstrate contributions to climate change resilience and/or mitigation as well as demonstrate the market linkages necessary to sustain the subproject activities beyond project closing. A PO's Business plan may include both PO-level investments and farm-level investments for PO members, depending on the objectives for CSA and market linkages identified in the Business plans. During subproject implementation, technical assistance will be provided to support adoption of CSA practices and technologies, environmental compliance with the CAR (see component 2), attainment of environmental certifications, and good business, management, and accounting practices. Family farmers operating in the 61 municipalities prioritized by the project will be eligible beneficiaries under this component.

[41] The productive alliance model traditionally refers to a business relationship (alliance) between a group of producers, technical assistance provider, commercial financial institution, and identified market or buyer. These parties enter into a joint business plan to meet a market demand while improving productivity, value addition, market position, and sales on a benefit-sharing basis. The participation of buyers is critical to the productive alliance model, as buyers provide the market linkages and may continue to do so after project support has ceased. The WB has successfully implemented the productive alliances model in several agricultural operations across the LAC region (*link*).

Box 1: Activities to be adopted under Climate-smart Agriculture Family Farming Business Plans

Subprojects under component 1 will be required, as a criterion for the grant award, to incorporate climate-smart agriculture (CSA) practices and technologies. CSA practices and technologies are those which contribute to achieving two or more of the three CSA pillars: improving productivity, adapting and improving resilience to climate change, and mitigating climate change. Those practices and technologies present in each subproject will moreover respond to the particular environmental and climate challenges at hand. Examples of such practices and technologies are:

- Activities directly linked to conservation such as harvesting of Brazil nuts from natural stands, beekeeping.
- Integration of cash crops such as cocoa and coffee in agroforestry restoration ("restauração produtiva", an approach that has worked well in the State of Para).
- Providing environmental services as part of Environmental Regularization Programs *(Programa de Regularização Ambiental – PRAs)* and Projects for Degraded and Altered Areas *(Programa de Recomposição de Áreas degradadas ou alteradas – PRADAs).*[42]
- Soil and water conservation and management practices.
- Pasture management, agro-silvo-pastoralism, and fodder production.
- Improved livestock management (health, genetics, feeding).
- Farmer-led irrigation and small-scale collective irrigation schemes.
- Improved water harvesting and storage in small, excavated ponds.
- On-farm drip and sprinkler irrigation technologies.
- Low-cost, energy-efficient water pumping systems (including renewable energy).
- Biodigesters (with livestock manure) for renewable energy.
- Facilities for composting crop residues.
- Activities to prevent forest fires such as maintaining natural fire breaks.

27. **To enhance inclusion under** this component, the project will finance two grant windows with different conditions tailored to the needs of POs with different levels of organization, business experience, and preparedness for commercial activities:

i. **"Commercial" family farming POs**: formal, well-structured, and experienced POs and members with active and regular activity in formal markets. These POs may seek commercial private financing to complement their business plan investments.
ii. **"Emerging" family farming POs**: formal POs and members with technical potential to achieve a considerable surplus production, but with surplus production currently deficient due to low productivity, poor organization and management, or deficient production quality standards.

28. **It is intended that through this window differentiation, family farmers are supported to "graduate" over time** from emerging to commercial models of production and from commercial models utilizing project support to those that can thrive on their own (see **Annex 2 Figure 1**). In addition, to support the inclusion of historically marginalized groups, a minimum of 15 percent of subprojects will be led by youth, a minimum of 15 percent will be led by women,

[42] Once registered in the CAR, private landholders are required to resolve any environmental liabilities established by SEMA through the preparation and implementation of Environmental Regularization Programs (PRAs) and Projects for Degraded and Altered Areas (PRADAs). While the project will not support the implementation of PRAs and PRADAs, it can finance aspects of their preparation.

and a minimum of 15 percent will be led by PIQCTs. Moreover, targets will be set across windows for the overall participation in business plan activities by these vulnerable groups (30 percent youth, 20 percent women, and 15 percent PIQCTs). To enhance gender equity in particular, a minimum of 15 percent of the funds allocated to POs under this component will be granted to women-led POs, and selection criteria will include a weighted scoring in favor of POs demonstrating at least 40 percent women membership.

29. **Specifically, this component will finance**: (i) works (minor PO and on-farm infrastructure), goods, training, technical assistance, and consulting and non-consulting services for the selection, preparation, and implementation of selected subprojects by participating partners; and (ii) matching grants to finance the implementation of CSA Family Farming Business Plans ("subprojects").

30. **The expected outcomes of component 1** are increased climate resilience of 9,000 family farmers, including historically marginalized groups (PIQCTs, women, youth), and improved market linkages to sustain climate resilient production models beyond project closing. The component also fosters long-term collaborations between the implementing agency (the State Secretary for Family Agriculture (*Secretaria de Agricultura Familiar de Mato Grosso – SEAF*), technical service providers (e.g., public and private providers), and financial institutions through strengthening their capacity to structure and finance climate-smart family farming investments.

31. **Subcomponent 1.1 – Pre-investments for the preparation of CSA Family Farming Business Plans: USD 5.0 million (USD 4.0 million IBRD, USD 1.0 million Government of Mato Grosso)**. All financing under this subcomponent will support the preparation of activities to be implemented under subcomponent 1.2. This will include activities to: (i) raise awareness of the project through outreach to family farming POs, commercial partners, and financing entities, including implementing a project communication and information dissemination strategy that includes those media preferred by women, youth, and PIQCTs and covers topics relevant to the needs and gaps faced by these groups among family farmers in Mato Grosso; (ii) identify, create, and consolidate productive alliances for CSA Family Farming Business Plans among family farming POs, commercial partners, and financing entities, including targeted communication strategies to help form productive alliances among historically vulnerable groups (PIQCTs, women, and youth beneficiaries); (iii) identify opportunities for CSA investments on the part of the POs (business proposal) through standardized diagnostics at both farm- and PO-levels; (iv) provide technical assistance (TA) to POs to prepare viable CSA Family Farming Business Plans; and (v) build capacity among technical service providers (public and private) to assist POs to implement CSA practices and technologies.

32. **The process for selecting POs to participate in component 1 will be supported by a Subproject Evaluation Committee, which will undertake the following activities**: (i) issue public calls for proposals, including detailed eligibility criteria (see **Box 2**), (ii) after each public call for proposals, review, evaluate, and select those proposals to be developed into CSA Family Farming Business Plans; (iii) for each round of Business Plan submissions, review, evaluate, and select those to be approved for implementation under subcomponent 2.2. Evaluations and selections undertaken by the Committee will follow the eligibility and selection criteria for each of the following 2 windows as will be set forth in detail in the Project Operational Manual (also see Annex 2 Figure 1).

33. **Subcomponent 1.2 – Productive investments in CSA Family Farming Business Plans: USD 56.0 million IBRD**. The purpose of this subcomponent is to support key investments ("subprojects") in CSA Family Farming Business Plans. As inclusion of CSA practices and technologies in CSA Family Farming Business Plan proposals is a PO eligibility criterion (see **Box 2**), all financing under this subcomponent will contribute to climate-smart outcomes. This subcomponent will provide matching grants to finance CSA Family Farming Business Plans selected as part of Subcomponent 1.1. Financing under Subcomponent 1.2 will support the implementation of such business plans, technical assistance, and

the incorporation of feedback and lessons learned into new cycles of calls for proposals. Co-financing grants will cover that portion of the CSA Family Farming Business Plan devoted to fixed capital (such as plant and equipment, minor infrastructure), operational costs, technical assistance expenditures, and other investments to support improving productivity, processing capacities, logistics, marketing, and sales. Technical assistance will be provided on improving the climate resilience of family farming, together with other good practices related to production, environmental compliance, and agribusiness. Technical assistance workers will be trained on gender sensitive approaches to allow them to assess gender-related issues, identify the economic contribution of women to family farming, and identify and address the barriers that may exclude women from participation and leadership in POs. Training and capacity building activities offered under this component for beneficiaries likewise will take into consideration the needs and topics relevant for women and to foster the participation and leadership of women family farmers.

Box 2: Eligibility of Producer Organizations (POs) under component 1

PO eligibility for participation under component 1 will include the following criteria, to be refined in the POM.

- Residence within the 61 selected municipalities.
- Proposal is for activities within one of the eight prioritized value chains.
- PO has a minimum of 30 members, where greater than half are family farmers holding *Declaração de Aptidão ao Pronaf (DAPs)* and *Cadastro de Agricultor Familiar (CAF).*[43]
- Proposal activities meet the criteria for participating under one of the two grant windows offered by the project ("commercial" and "emerging") (see Annex 2 Figure 1).
- Proposal activities (including for collective investment in POs) will benefit family farmers. Direct investments in primary production are made only for family farms holding DAPs and CAFs.
- Proposal activities will benefit historically marginalized groups targeted by the project (PIQCTs, women, youth).
- Proposal includes the adoption and maintenance of CSA practices and technologies (see Box 1).
- Proposal demonstrates adequate guarantees for the sustainable use of natural resources.
- Proposal meets environmental and social safeguarding requirements.
- Proposal is financially viable.

Component 2 – Improved land and environmental management: USD 19.0 million (USD 13.0 million IBRD; USD 6.0 million Government of Mato Grosso).

34. **The purpose of component 2 is to increase the generation of environmental benefits, including for climate resilience and mitigation, of family farming in Mato Grosso**. This will be achieved through investments in land and environmental management that (i) address key institutional barriers for family farmers to finance on-farm investments in climate-resilient models of production such as those promoted under component 1 as well as compliance with the Forest Code (subcomponent 2.1),[44] and (ii) strengthen the monitoring and control of carbon-emitting forest fires and forest degradation and deforestation in family farming areas and PIQCT communities (subcomponent 2.2). All financing under this component will support investments that generate benefits for climate change resilience and mitigation. Key expected outcomes from this component are **12,900** family farmers and PIQCTs

[43] *National Program for Strengthening Family Agriculture*.

[44] Insecure land tenure affects the ability of people, communities and organizations to make changes to land that can advance adaptation and mitigation outcomes (*IPCC 2019*). The adoption of sustainable land management and poverty eradication can be enabled by improving access to markets, securing land tenure, factoring environmental costs into food, making payments for ecosystem services, and enhancing local and community collective action (*IPCC 2020*).

benefitting from improved interinstitutional coordination among the Secretariat of Family Agriculture (SEAF), the Mato Grosso Secretariat for the Environment (SEMA), INTERMAT, and the Mato Grosso General Comptroller of Justice Office (*Corregedoria-Geral da Justiça de Mato Grosso – CGJ*)[45] to deliver land and environmental services. These services in turn enable family farmers to access public finance, which many require in order to adopt practices to reduce the incidence of forest fires and prevent forest degradation and deforestation in family farming areas and PIQCT communities.

35. **Subcomponent 2.1 – Support for land and environmental regularization: USD 16.0 million (USD 13.0 million IBRD, USD 3.0 million Government of Mato Grosso)**. This subcomponent will support land and environmental regularization for an estimated 12,900 family farmers and PIQCTs, constituting critical steps in enabling them to invest in on-farm transition to sustainable models of production and enable environmental compliance with the Forest Code. Eligible beneficiaries will include those family farmers whose POs respond to the Expression of Interest for business plan under component 1 as well as family farmers and PIQCTs residing within the 35 State Settlements. Land regularization activities will be led by INTERMAT as the State institution responsible for land administration, with the support of CGJ and a consultancy specialized in land administration. Environmental regularization will be led by SEMA and will utilize a new SIMCAR module, *"SIMCAR Assentamento"*. This module will allow the consolidation of all properties found within a Settlement into a single CAR for the Settlement and the recognition of common APP areas within Settlements, thereby streamlining and improving the analysis and validation processes.

36. **For land regularization, the subcomponent would support the following activities**: (i) diagnostic of the land regularization situation in 35 State Settlements (corresponding to 1,900 properties covering 46,740 hectares), which are the only remaining State Settlements currently without support for land regularization; (ii) contracting of georeferencing services and occupational inspection services (social visits and technical inspections) for the selected Settlements; (iii) inspections of georeferencing activities and implementation of occupational surveys and processing of land titling for the selected Settlements. To enhance contributions to gender inclusion, land titles will be issued in the name of the women of the family and/or of the married couple in order to enhance women ownership and control over land in the family farming sector. A minimum portion of land regularization titles will be issued in the name of women, as shown in the results framework; (iv) community self-mapping activities for PIQCTs and the preparation of anthropological reports for 40 *quilombo* communities, a critical step in the regularization of *Quilombolo* territories; (v) strengthen CGJ capacity to speed up land regularization processes for family farmers and traditional communities; and (vi) diagnostics and activities to strengthen the capacity of INTERMAT to establish effective policies for family farmers and traditional communities.

37. **For environmental regularization, the subcomponent would support the following activities**: (i) contracting services to prepare the CAR for rural properties and trainings to reduce the number of outstanding CARs; (ii) training of SEMA analysts for the validation of records (the analysts will be hired by SEMA as part of the government contribution); (iii) establishing procedures to address the delays in analyses; (iv) training staff from institutions with strong family farmer outreach capacity to support those family farmers they work with in providing information and entering data in the system; (v) purchase of computer equipment and software needed to proceed with the analysis and processing of CAR declarations; (vi) analysis to resolve overlaps of georeferenced plots in the database, a main bottleneck delaying validation of registry requests; and (vii) diagnostics and activities to strengthen the capacity of SEMA to establish effective policies for family farmers and traditional communities. In addition, component 2 will

[45] The Mato Grosso General Comptroller of Justice Office (CGJ) regulates and inspects the notarial offices (cartórios), used for land registration, and mediates potential land conflicts.

support carbon balance assessments of a select number of family farms to capture the project contributions to climate change mitigation.

38. **Subcomponent 2.2 – Prevention and control of forest fire and deforestation in family farming areas: USD 3.0 million - Government of Mato Grosso**. This subcomponent will strengthen the capacity of SEMA to monitor and control deforestation and fire events as well as support its partners in efforts to prevent deforestation at local level. Specifically, this subcomponent will support: (i) the improvement of the forest monitoring system, which uses satellite images to integrate information and real-time alerts from different data sources and, through the elaboration of periodic maps, allows SEMA to monitor changes in land use and identify hotspots of deforestation and forest fire in family farming areas; (ii) environmental education activities tailored to family farmers located in deforestation and forest fire hotspots, aiming to reduce their contribution to deforestation in Mato Grosso and use of fire on agricultural lands; (iii) ground equipment for inspection on-site; and (iv) training and equipment for civilian and volunteer fire brigade members.

Component 3 – Project management and coordination: USD 20.0 million (USD 7.0 million IBRD, USD 13.0 million - Government of Mato Grosso).

39. **The objective of this component is to provide the PMU with the conditions and information necessary for the effective management and coordination of the project**. Component 3 will finance: (i) project management and coordination with partner institutions; (ii) diagnostics to support components 1 and 2;[46] (iii) project monitoring and evaluation (M&E) and impact assessment of project activities; (iv) fiduciary implementation and external audits; (v) environmental and social risk/safeguards oversight and management; (vi) the design and implementation of a project communication strategy and stakeholder engagement strategy, including the Stakeholder Engagement Plan (SEP), Grievance Redress Mechanism (GRM), and beneficiary satisfaction survey; and (vii) improvement of existing information systems and geo-referencing tools including the SEAF Social Indicator System (e-SIEAF) and the Unified State System of Family and Small-Sized Agroindustrial Health. Specifically, this component will finance goods, training, operational costs, and consulting and non-consulting services.

40. **To support improved inter-institutional coordination among the institutions involved in the project, a PMU Consultative Committee will be established.** The committee will be comprised of representatives of SEAF, INTERMAT, CGJ, SEMA, EMPAER, PCI, the Governor's Office (Casa Civil), and the State Department of Finance of Mato Grosso *(Secretaria de Estado de Fazenda – SEFAZ*). The Committee, to be led by SEAF, will meet regularly and collectively agree on all strategic decisions pertaining to the project, contributing to the effective management and coordination of the project.

Component 4 – Contingency Emergency Response Component (CERC): US$ 0.0 million.

41. **This component will provide for an immediate response to an eligible crisis or emergency, as needed**. In the event of such an emergency (as defined in the Contingency Emergency Response Operational Manual to be prepared and adopted by the Government of Mato Grosso), this component will finance eligible emergency activities and expenditures through the reallocation of funds from the project.

[46] Diagnostics will include for example studies to identify bottlenecks and opportunities for addressing climate change challenges on farm as well as in processing, marketing, and the level of the PO and pilots to geo-reference intervention areas and measure impacts on carbon stocks of project interventions.

Other Design Aspects

42. **Climate change.** A GHG assessment of the project was carried out using the ex-ante carbon-balance tool (EX-ACT), which quantifies the net carbon balance expressed in tCO2e, resulting from GHGs emitted or sequestered during the project implementation and capitalization period (20 years) compared to the without-project scenario. The project leads to estimated annual climate change mitigation benefits of 661,922 tCO2e, when compared to a business-as-usual baseline scenario. This is equivalent to annually reduced GHG emissions per hectare of 12.3 tCO2e. After 20 years, GHG mitigation benefits amounting to a reduction of 13,238,436 tCO2e will be generated. The approach, methods, and results of the GHG analysis are found in Annex 5. The project was also screened for Climate Change and Disaster Risks using the World Bank Climate and Disaster Risk Screening Tool and assessed as having an overall risk rating of "Low." While the exposure of the project location to climate and disaster risk challenges was rated High, the potential impacts on project investments are rated Low given the project's inherent focus on improving resilience and mitigating the impacts of climate change. The project's soft components and development context further contribute to reducing climate and disaster risk in the project areas. The overall Outcome rating is thus Low.

43. **Gender.** The project conducted a gender gap assessment and prepared a Gender Action Plan to encourage the equitable gender participation in the activities and eventual generation of income and work resulting from the interventions (see Annex 3). Based on the assessment and as shown in the Gender Action Plan, the project will address the prevailing gender gaps among family farmers in Mato Grosso by (i) implementing a project communication and information dissemination strategy that includes those media preferred by women and covers topics relevant to women's needs and the gender gaps found among family farmers in Mato Grosso; (ii) incorporating beneficiary targeting criteria that explicitly include gender equality aims in the preparation and implementation of Climate Smart Agriculture Family Farming Business Plans under component 1 (a minimum of 15 percent of subprojects will be led by women across the grant windows and a minimum of 20 percent of beneficiaries across all windows will be women) and the land regularization activities under component 2 (a minimum of 15 percent of the land regularization titles issued will be in the name of women); and (iii) utilizing a monitoring and evaluation approach (including gender-disaggregated indicators) for the project that ensures women have the opportunity to express their views and share their concerns (see the project description for more detail). Through these measures, the project expects to contribute to reducing gender inclusion and income gaps among its beneficiaries.

44. **Inclusion**. The project will also seek to include youth and PIQCT communities in project benefits. This will be accomplished through tailoring project outreach, capacity building, and technical assistance to the needs and preferences of these groups. For example, regarding outreach, the project will design a communication and information dissemination strategy that includes those media preferred by youth and PIQCTs and covers topics relevant to the needs and gaps they face to capturing benefits from the family farmers in Mato Grosso. Regarding capacity building and technical assistance, the project will offer leadership trainings targeted to youth and PIQCTs to promote not only their participation in component 1, but their leadership of business plan proposals and subproject implementation. In addition, key indicators will be disaggregated to track the flow of project benefits to youth and PIQCT communities: a minimum of 15 percent of subprojects will be led by youth and a minimum of 15 percent will be led by PIQCTs; moreover, targets are set across windows for the overall participation in business plan activities (30 percent youth, 15 percent PIQCTs).

45. **Maximizing finance for development (MFD)**. The project will help to create the pre-conditions for full implementation of the MFD approach. Under component 1, the project will provide opportunities for beneficiary POs and their members to access commercial financial institutions to support their investment activities. Those POs which

do not access such financing will, through the project, be better prepared to interact with established market players under the productive alliance approach going forward.

46. **Citizen Engagement.** The proposed project will rely on a strong communication and engagement strategy to reach out to key stakeholders to facilitate a common understanding of the vision, values and community needs through a neutral, nonthreatening, and constructive forum. This strategy will take into consideration the distinct and special needs of disadvantaged and vulnerable social groups (including women, youth, and PIQCTs). A citizen engagement indicator is also included in the project results framework (Percent of beneficiaries satisfied with project interventions, disaggregated by gender, youth, and PIQCT).

47. **Grievance Redress Mechanism (GRM)**. The project will utilize the multiple existing channels for receiving and redressing complaints currently operated by SEAF, SEMA and INTERMAT, which include a website, telephone lines, and physical mailing address. In addition, SEAF, INTERMAT, and SEMA together operate an Ombudsman Office with a dedicated free phone line, website, and e-mail address. The project's GRM will rely on these existing structures, channels, and procedures already in place. Moreover, the GRM will be strengthened during project implementation, based on the provisions established in the ESMF. The ESMF also contains a strengthened requirement for establishing grievance mechanisms at the level of the subprojects. The project Results Framework also includes an indicator to monitor grievances.

48. **Communities and individuals who believe that they are adversely affected by a WB-supported project may submit complaints to existing project-level GRMs or the WB Grievance Redress Service (GRS)**. The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project-affected communities and individuals may submit their complaint 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 WB's attention, and WB Management has been given an opportunity to respond. For information on how to submit complaints to WB's corporate GRS, visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the WB Inspection Panel, visit *www.inspectionpanel.org*.

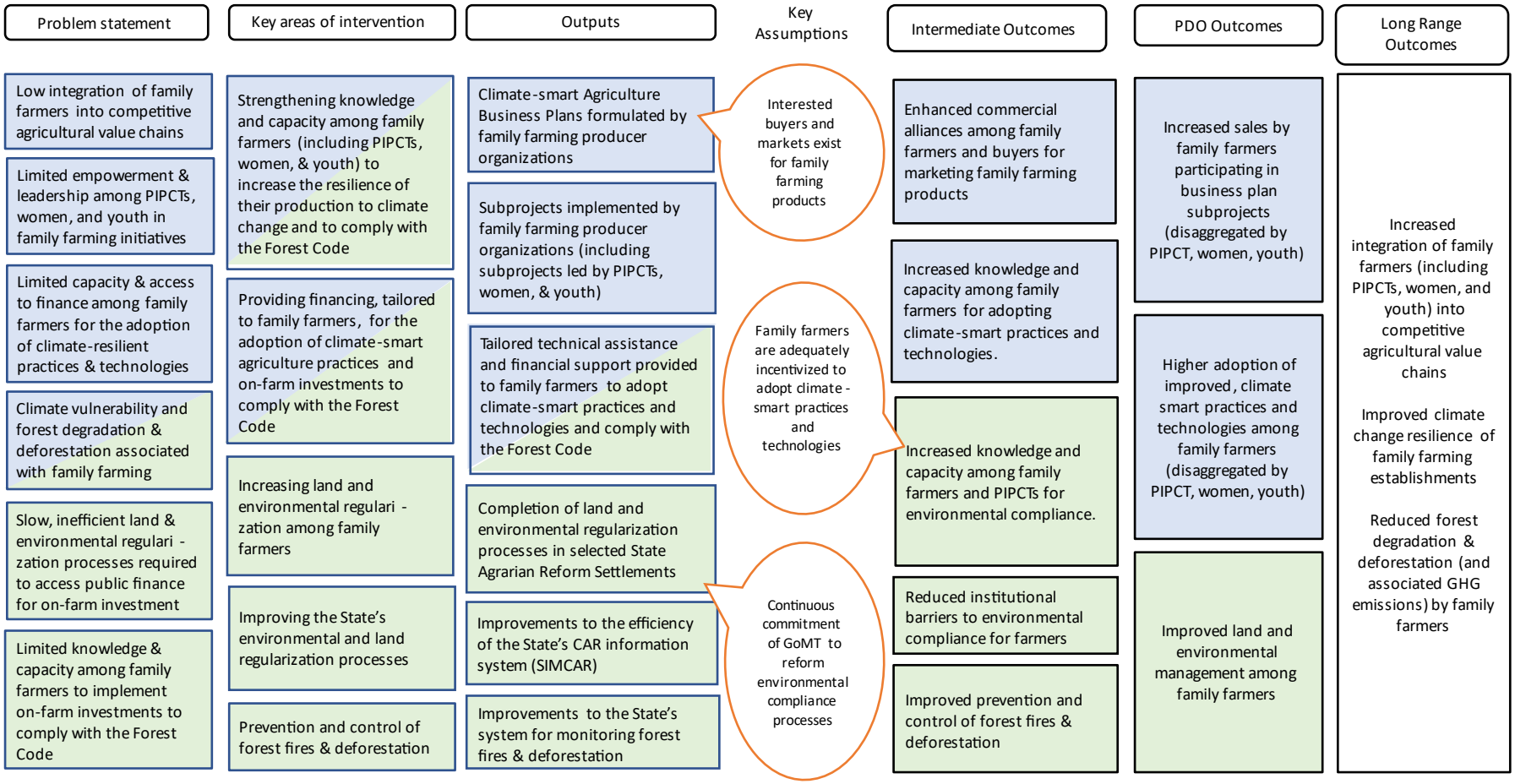
C. Results Chain

49. **The project aims to address key challenges and opportunities facing family farming in Mato Grosso: low integration into competitive value chains, vulnerability to climate change, association with forest degradation and deforestation, and limited knowledge, capacity and access to finance for on-farm improvements to address these challenges**. The project's three components aim to tackle these challenges through a mix of targeted technical assistance and capacity building, finance provision, and support to key land and environmental institutional processes. The theory of change (ToC) is presented in Figure 5, where challenges, activities, outputs, and outcomes related to market access and climate resilience (the first two themes of the PDO) are shaded blue and those related to land and environmental management (the third theme of the PDO) in green. As shown in the ToC, the project design includes a significant level of integration among the components, with some activities and outputs contributing to multiple PDO themes.

Project costs and financing

Project Component	Total Cost (US$ million)	IBRD (US$ million)	Counterpart Funding (US$ million)
1. Climate-smart economic inclusion	**61.0**	60.0	1.0
1.1: Pre-investments for the preparation of CSA Family Farming Business Plans	*5.0*	4.0	1.0
1.2: Productive investments in CSA Family Farming Business Plans	56.0	56.0	0.0
2. Improved land and environmental management	**19.0**	13.0	6.0
2.1: Support for land & environmental regularization	16.0	13.0	3.0
2.2: Prevention and control of forest fire & deforestation in family farming areas	3.0	0.0	3.0
3. Project management and coordination	**20.0**	7.0	13.0
4. Contingency Emergency Response Component	**0.0**	0.0	0.0
Total Costs	**100.0**	**80.0**	**20.0**

Figure 5: Project theory of change



D. Rationale for Bank Involvement and Role of Partners

50. **Overcoming market failures**. Family farming and community organizations in the rural space usually show low levels of productivity, limited added value, and questionable sustainability, operating in a context marked by under-provision of effective rural extension and other non-financial services, as well as limited access to financing. This rural space is where integration to dynamic markets has been hampered by weak organizational and business management capacities, information asymmetries, and diseconomies of scale. Public sector capital transfers to co-finance private ventures of organized small-scale rural producers and service providers, coupled with provision of technical assistance and organizational and business development support are justified based on overcoming these market failures that have prevented this segment of the rural economy from successfully integrating into dynamic and more profitable markets.

51. **Experience and lessons from other engagements**. The World Bank's long-standing engagement through a series of loans in the South-Southeast and Northeast regions[47] places it in a unique position to share key lessons learned in areas of rural development, poverty reduction, climate resilience, sustainable water services provision, decentralization and participatory methodologies. Furthermore, the Bank´s recent experience in the implementation of rural productive alliances projects in Latin America, as well as for development and usage of agro-climatic information systems, would be instrumental to support this operation.

52. **Institutional framework**. This project will not have external co-financiers or international partners but will rely on an extensive network of public and private institutions (both national and state entities). These institutions will be contributing with their own skills and experiences under a strong and tightly coordinated framework, collaborating towards ensuring the achievement of the intended project outcomes. For example, Mato Grosso, led by PCI, is in advanced stages of negotiation with the Department for Business, Energy and Industrial Strategy (BEIS) of the United Kingdom and the German national development bank KfW to extend the support for Mato Grosso received under the REDD-REM Program.

E. Lessons Learned and Reflected in the Project Design

53. **Productive alliance projects need to provide differentiated approaches for different beneficiary types**. Previous experiences with productive alliance approaches in World Bank projects in Brazil, Honduras, and other Latin American countries have shown that different types of beneficiaries face different challenges to improving productivity, competitiveness, and market access. Not all smallholders receiving "productive" support (matching grants and technical assistance) are able to realize increased sales or reach demanding markets, and a large proportion of them are not able to integrate successfully into these demanding value chains. Designs of newer operations will need to include differentiated lines of support for more vulnerable versus more commercial farmers.

54. **Assistance with land and environmental regularization is critical for productive restoration, and business development.** For many family farmers, both in rural settlements *("assentamentos rurais"*) and elsewhere, non-compliance with environmental laws on the percentage of the land that needs to remain conserved *("Reserva legal"*) is a major hindrance for the development of sustainable agriculture, livestock raising and agroforestry as without such compliance, it is not possible to obtain credit. Mato Grosso Law allows for the establishment of agroforestry to comply

[47] These include for example: the Bahia Sustainable Rural Development Project (P147157), closed in 2022; the Ceara Rural Sustainable Development and Competitiveness Project (P121167), closed in 2019; and the Paraiba Sustainable Rural Development (P147158), approved in 2017.

with restoration obligations under the Rural Environment Cadaster (CAR[48]), a regulation with which other Brazilian Amazon States like Para have had positive experiences. Other value chains, such as milk, may also provide opportunities to productive restoration through sustainable intensification. Calls for proposals will seek to maximize the adoption of such strategies. At the same time, farmers will shy away from investment without secure land tenure. Land tenure and compliance with the Brazilian forest code are sine qua non conditions to access credit and some forms of public sector assistance. However, farmers will not seek to register their land in the CAR to follow the steps for environmental compliance if they are not sure of being able to implement a mandatory environmental restoration plan. The project will assist beneficiaries of matching grants and technical assistance for business development in, among others (i) obtaining land titles, (ii) investing in their plot to comply with the forest code.

55. **Innovative solutions can foster sustainable forest management through economic and social inclusion, while delivering conservation and development dividends.** In the Amazonas State, the Bolsa Floresta Program is one of the largest payment-for-environmental services (PES) schemes in the world, reaching traditional populations living in State-owned protected areas (conservation units). The Bolsa Floresta Program includes a direct cash transfer of 600 Brazilian reais (approximately US$150) per year to approximately 9,600 – primarily female-headed – household beneficiaries, contingent upon maintaining the native forest, and adopting measures for forest fire prevention and good forest management practices. Results achieved include an increase in family income, higher convergence of economic activities and conservation, and a commensurate reduction in deforestation with direct climate mitigation and adaptation benefits. The program also results in positive climate adaptation impacts, as Bolsa Floresta beneficiaries are among the poorest and most vulnerable to the adverse effects of climate change. The multiple benefits generated by this operation show the strong potential for integrated landscape approaches that involve multiple sectors to deliver economic, climate change, and environmental sustainability outcomes jointly. This operation will pursue the exchange of information with the administration to evaluate ways to promote sustainable forest management, while addressing gender issues among family farmers.

56. **Development of capacities at the territory level and multi-agency coordination are critical for project implementation and post-project sustainability**. The improvement of technical and information systems capacity at central level is insufficient to imprint the necessary speed to land administration and environmental cadaster processes nor to provide suitable landscape management and technical solutions for businesses throughout Mato Grosso. In addition, effective coordination is needed among different institutions. Projects tend to be more efficient when the coordination of operations, financial management, monitoring and evaluation are centralized under the main implementing institution, but all the government partners with the necessary mandates are included and have clear roles, responsibilities, as well as adequate incentives and mechanisms for intervention. The project will assess the demand for public services and the existing institutional capacity of relevant agencies, to facilitate the process of designing appropriate institutional arrangements that aim at addressing specific gaps.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

57. **The State of Mato Grosso will be the Borrower for the loan, with the Federative Republic of Brazil serving as**

[48] The CAR sets a deadline for farmers to electronically register fragile areas (Permanent Preservation Areas – APP) and part of the original native vegetation (Legal Reserve – RL) in their properties, and to submit proposals for restoring their degraded areas if they are not compliant.

the Guarantor. The Secretariat of Family Agriculture (Secretaria Estadual de Agricultura Familiar – SEAF) will be the project implementing agency. SEAF will have the overall responsibility for the implementation of the project, including ensuring that sufficient counterpart resources to implement the project are foreseen in Mato Grosso's budget. A Project Management Unit (PMU) will be established within SEAF. The PMU will be responsible for the management and coordination of project activities including all of the project's fiduciary, safeguards, and monitoring and evaluation aspects, at both central and field levels. The PMU will also be responsible for project communications and stakeholder engagement.

58. **Three institutions will assist SEAF to carry out specific project activities under component 2**: INTERMAT, the Mato Grosso General Comptroller of Justice Office (CGJ), and the Mato Grosso State Secretariat for the Environment (SEMA). The institutions and their roles and responsibilities in the project are detailed in Annex 1. Once the project is effective, SEAF will enter into Cooperation Agreements with INTERMAT, CGJ, and SEMA. The Cooperation Agreements will set out the obligations of each institution to assist in carrying out their respective project activities.

59. **SEAF will also recruit *Fundação Uniselva*[49] as a procurement agent, under a Procurement Agent Agreement.** Fundação Uniselva will assist in hiring staff for the PMU and partner institutions and to provide technical assistance and small-scale procurement services for subprojects. The fiduciary capacity of Fundação Uniselva was assessed in June 2023 and validated during project appraisal as acceptable to the Bank. The Fundação Uniselva contract will be financed with the funds from Government of Mato Grosso.

60. **Inter-agency coordination and oversight will be facilitated by a project Consultative Committee**. The committee will be comprised of representatives of SEAF, INTERMAT, CGJ, SEMA, EMPAER, PCI, the Governor's Office (Casa Civil), and SEFAZ. Component 1 will be furthermore supported by a Subproject Evaluation Committee. See additional detail in Annex 1.

B. Results Monitoring and Evaluation Arrangements

61. **The PMU housed within SEAF will have overall responsibility for project data collection, monitoring and evaluation (M&E).** The M&E responsibilities include tracking progress on the indicators of the Results Framework at the end of each semester (biannually), as well as tracking project progress at the technical, fiduciary, and social and environmental levels. The PMU will coordinate the project M&E strategy, including the collection and systematization of data in collaboration with SEMA, INTERMAT, public and private sector service providers, and other partners as needed. Project data will be consolidated in a computerized information system that will be housed at SEAF within the PMU. One component of this system will be a comprehensive digital registry of beneficiaries reached by the project. The M&E approach will include feedback loops to allow beneficiaries, in particular historically marginalized groups (PIQCTs, women, youth) to express their views and share their concerns. Project M&E will follow the indicator definitions, data sources, and methodologies as set out in the Results Framework and detailed further in the POM.

C. Sustainability

62. **The project has a strong focus on sustainability of project results**. Financial sustainability will be achieved through the leveraging of private finance through productive alliances under Component 1, leading to a more market-driven financing for climate resilient economic activities of family farmers. Socioeconomic sustainability will be achieved

[49] Fundação Uniselva is a non-profit private law entity, created by Law No. 8.958/94, with the objective to provide executive, administrative and financial management support to public entities to execute their projects.

through the successful implementation of subprojects, which are anticipated to generate increased income to family farmers and PIQCTs. The project will promote participation and ownership for all participants in the productive alliances, with project beneficiaries taking on decision making, implementation, and cost sharing, thus increasing sustainability of the model. Finally, institutional sustainability will be achieved through the institutional strengthening activities under Component 2. These are expected to strengthen local and state operational capacities for environmental management and land tenure regularization, which will endure beyond the closing of the project.

IV. PROJECT APPRAISAL SUMMARY

A. Economic and Financial Analysis

63. **The project is expected to contribute to increased and more stable incomes of smallholder farmers** through: (i) adoption of practices and technologies that enhance agricultural and livestock productivity; (ii) adoption of practices that contribute to improved resilience to climate change and extreme weather events; iii) enhanced processing efficiency; and iv) improved quality of products and access to markets that remunerate quality.

64. **These benefits will be brought about by targeted technical assistance, investments in infrastructure and equipment, and changes in inputs and production factors use as designed in each PO business plan**. The project will focus on the most promising value chains for family agriculture in Mato Grosso from a financial return and competitiveness standpoint. These value chains are: a) milk and dairy products, b) fruit tree crops fresh and for pulp; c) fruit and vegetables; d) cassava; e) cocoa integrated in a agroforestry system; f) coffee; and g) beekeeping products. Interested producer groups, responding to market opportunities will ultimately determine the product mix of their business plans. The project is expected to support two types of POs: (i) “commercial”, cooperatives, or associations with the aim to become cooperatives, that plan to sell as a group to formal private markets (wholesalers and retailers); and (ii) “emerging”, associations that aim at improving the individual production of their members and organize and improve their sales, but do not aim at selling as a group yet, or aim at selling to institutional markets.

65. **For component 1, the economic analysis is based on a cash flow that considers the phasing in of the total estimated investment in producer organizations – direct (subprojects) and indirect (structuring of technical assistance services, management costs, etc.).** The overall project cash flow was constructed for “with” and “without” project intervention scenarios, as well and for the difference between these two. The analysis is made considering economic prices and accounts for estimated externalities in terms of carbon sequestration or avoided emissions estimated using Ex-act for the changes in land use described in each illustrative case. Key-indicators of the analysis are Project Net Present Value (NPV), and Project Economic Internal Rate of Return (EIRR). Component 2 will invest in strengthening existing government capacity for family farms, land administration and environmental legal compliance. It will add to multiple existing efforts and sources of finance and therefore its economic and financial analysis as a whole is not granted.

66. **Results**. The economic analysis shows that the project is an economically viable investment for the economy. In the baseline scenario the project yields a 20 percent economic internal rate of return and a net present value of R$ 298 million before accounting for environmental benefits from reducing GHG. The scenarios with economic benefits from reducing GHG are largely positive, signaling the potential carbon markets can have in the future in providing incentives for change (see the full economic and financial analysis in Annex 4 and the greenhouse gas analysis in Annex

5). The project is also considered to be aligned with Brazil's climate strategies and plans, and with the country's pathway towards climate-resilient development and low greenhouse gas emissions.

67. **Paris Alignment**. The operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation. Assessment and reduction of adaptation risks**:** The main climate and disaster risks likely to affect the project, namely productive investments under subprojects, are drought and forest fire. The project design takes into consideration the drought, precipitation reductions, and forest fire risks that threaten the outcomes of the project. Specifically, climate change risks and vulnerability to precipitation reduction and soil water deficit will be managed and mitigated through targeted adaptation measures, by combining structural, nature-based, and soft adaptation solutions, including climate vulnerability diagnostics and the adoption of improved, climate-smart agriculture practices and technologies (component 1) as well as improved monitoring and control of forest fires (component 2). Promotion of climate-smart crop and silvopastoral systems that combine adapted crops, pasture, agroforestry, and livestock with soil and water management practices to make more efficient use of the resources and biodiversity, will enhance the resilience of family farmers and ecosystems to unreliable rains, high temperatures, drought, and forest fire. Through pre-investments for the preparation of CSA family farming business plans (subcomponent 1.1) and improved land and environmental management (component 2), the project will build the capacity of family farms and the State's land and environmental institutions, respectively, to strengthen their resilience to climate risks through facilitating an enabling environment for the adoption of CSA practices and technologies, strengthening capacity to speed up land regularization processes for family farmers and improvement of forest monitoring system. Therefore, the operation adequately reduces the physical climate risks to the project outcomes, and the project's climate resilience and adaptation design considerations limit the exposure to a low level of residual risk.

68. **Assessment and reduction of mitigation risks:** The operation supports activities that are neutral or encourage the country's progress toward low-carbon development. Under component 1, the promotion and adoption of CSA practices and technologies, crop and livestock production using CSA approaches, and integrated land management (agroforestry) are on the Universally Aligned (UA) list and considered to be fully consistent with low-GHG development pathways. Component 1 activities in all value chains, including livestock, will promote intensification on existing productive areas with no expansion into areas of high carbon stocks or high biodiversity, as well as integrated land management such as integrated cropland-livestock-forestry systems, improved manure management, improved pasture management, and on-farm energy efficiency, among others (see Box 1); all of these activities are on the UA list. Under the context of family farms, the project's CSA livestock (dairy) investment is not only interlinked with silvopastoral agroforestry but also increases animal productivity while demonstrably decreasing the GHG intensity of the milk produced per animal (see Annex 5 for the project GHG assessment). Under component 2, support for environmental compliance with the Forest and improved monitoring and control of deforestation are on the UA list under the category of Economic Services (sub-category land administration and capacity building). Thus, the project is considered to be aligned with Brazil's climate strategies and plans, and with the country's pathway towards climate-resilient development and low greenhouse gas emissions.

B. Fiduciary

Financial Management

69. **Financial Management Assessment (FMA)**. **The Bank performed an FMA of SEAF[50]** in June 2023 in accordance with the Bank Policy: Investment Project Financing and Bank Directive: Investment Project Financing and the Financial Management in Bank-Financed Operations and Other Operational Matters (effective September 7, 2021).

70. **The scope of the FMA included:** (i) an evaluation of existing FM systems to be used for project monitoring, accounting, and reporting; (ii) a review of staffing arrangements; (iii) a review of the flow of funds arrangements; (iv) a review of internal control mechanisms in place, including internal audit; (v) a discussion with regards to reporting requirements; and (vi) a confirmation of the external audit arrangements. FM arrangements should place emphasis on governance controls applicable to project components. This approach considers current procedures, norms, and the institutional capacity, and emphasizes simple procedures, with a high degree of transparency and accountability, and decision making and management responsibilities at the direct administration level.

71. **The existing Public Financial Management System of Mato Grosso has satisfactory internal rules and controls, with a clear definition of responsibilities and institutional arrangements**. SEAF, in conjunction with the state's Secretariat of Planning and Management, are responsible for budget preparation, treasury management and accounting functions. The State Internal Control Agency (*Controladoria Geral do Estado de Mato Grosso – CGE-MT)* carries out internal audits overseeing the budget and is responsible for fighting acts of corruption and enhancing transparency within the state public administration. The State Court of Accounts (*Tribunal de Contas do Estado de Mato Grosso – TCE-MT*) (i.e., the subnational supreme audit institution) has the mandate to audit all public expenditures. Both the TCE-MT and CGE-MT have sufficient autonomy and their recommendations are generally implemented.

72. **The overall conclusion of the FMA is that**: (i) the FM arrangements for the proposed project are considered acceptable;[51] (ii) the funds flow, disbursements, monitoring, auditing, and supervision arrangements have been designed in a way to respond to the project's implementation arrangements; and (iii) the overall FM residual risk rating after mitigation measures applied is **Substantial.** There are no FM-related conditions for negotiations, board and/or effectiveness.

73. **The FMA identified the following risk to the achievement of the Project Development Objective**: (i) the nature of the project design involving multi-executing agencies[52] and multiple flow of funds", (ii) activities would be implemented at the decentralized level, with potential delays to project implementation, (iii) SEAF/Uniselva's lack of FM personnel exclusive to manage the project, and (iv) SEAF/Uniselva lack of experience with Bank's policies and procedures with potential delays in contract bidding processes and disbursements at the start of implementation.

74. **Mitigation measures to address the above risks include**: (i) and (ii) continued close Bank's support and supervision, and CGE-MT review of the project internal control adequacy; (iii) appointment of two fully dedicated financial management staff well conversant with the World Bank procedures for project financial management which

[50] "Secretaria de Estado de Agricultura Familiar" or Secretariat of Family Agriculture. The FMA was performed in accordance with OP/BP 10.00, the Financial Management in Bank-Financed Operations and Other Operational Matters (effective September 7, 2021).
[51] Arrangements are acceptable if they are considered capable of recording correctly all budgets, transactions, and balances, supporting the preparation of regular and reliable financial statements, safeguarding the entity's assets, and are subject to auditing arrangements acceptable to the Bank.
[52] SEMA - Secretaria de Meio Ambiente, Mato Grosso General Comptroller of Justice Office (CGJ) , INTERMAT- Instituto de Terras de Mato Grosso, and Fundação UNISELVA.

will monitor the timely decentralized implementation; and (iv) staff should participate in all offered fiduciary training throughout project's life.

75. **Integrated Fiduciary Risk Rating**: The integrated fiduciary risk, which assess the likelihood and impact of the FM risk and procurement risk, considering governance and anti-corruption risks, that funds will not be used for intended purposes to achieve value for money with integrity in delivering sustainable development is assessed as **Substantial.**

Procurement

76. **All project procurement will be carried out in compliance with the applicable World Bank procurement guidelines and procurement policies for Investment Project Financing** (Procurement Regulations for IPF Borrowers, issued in July 2016, revised in November 2017, August 2018, November 2020, and September 2023 - "Procurement Regulations"). Procurement arrangements shall be in line with all major aspects of the operation and they shall observe features and context described in the Project Procurement Strategy for Development (PPSD document) prepared by the Borrower. Procurement planning for the proposed project shall follow provisions outlined in paragraph 5.9 of the above mentioned "Procurement Regulations" and the Bank's Systematic Tracking and Exchanges in Procurement (STEP) system will be used to prepare, clear and update Procurement Plans and conduct all procurement transactions for the project.

77. **The project's implementation arrangements in terms of procurement aspects shall be clearly reflected in the Project's Operational Manual**. These include arrangements with *Fundação Uniselva* that SEAF will recruit as a procurement agent to assist in hiring staff for the PMU and partner institutions and to provide technical assistance and small-scale procurement services for subprojects. The procurement capacity of Fundação Uniselva was assessed as acceptable to the Bank, provided they undergo training provided by the Bank. The Uniselva contract will be financed with the counterpart funds of Mato Grosso.

78. **All project procurement shall be planned and managed through the Bank's online procurement planning and tracking tool** described in the Procurement Regulations for IPF Borrowers (paragraph 5.9), Systematic Tracking and Exchanges in Procurement (STEP), that is the mandatory system to be used to prepare, clear and update Procurement Plans and conduct all procurement transactions for the project. The project's procurement plan shall be uploaded into STEP and approved by the Bank before negotiations. The Bank's team will provide training and support aiming at a smooth operation of the mentioned system. All procurement to be processed by Fundação Uniselva will be reflected in the procurement plan in STEP.

79. **The PPSD has been prepared by the Borrower and approved by the Bank on March 2023**. It draws a procurement strategy and arrangements that are proportional to the risk and estimated value of all contracts that will be executed during project implementation. This approach will be reflected in the Procurement Plan to be uploaded in STEP.

80. **A Special Bidding Committee will be established at the PMU/SEAF and will be responsible for executing and coordinating procurement activities**, with support from the borrower's technical teams. All communication with the World Bank for missions, Procurement Plan (STEP) updates, non-objection requests, accountability, progress reports, among others, will be done through the PMU.

81. **An initial Procurement Capacity Assessment of the PMU/SEAF and Fundação Uniselva has been carried out during preparation phase**. This assessment has considered both entities to have the minimum necessary experience

and staff to answer to the project's procurement needs, provided that they attend procurement training to be provided by the Bank.

C. Legal Operational Policies

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

82. **The environmental risk rating of the project is Moderate, whereas the social is Substantial**. The project will support the adoption of climate-smart technologies and measures focusing on climate mitigation and adaptation as well as the improvement of production processes and value addition in key value chains, through the development of diagnostics and matching grants for investment subprojects potentially including minor on-farm infrastructure including water-efficient irrigation; plantations; energy, soil, water, vegetation and biodiversity conservation measures; provision and utilization of inputs, equipment and tools; and off-farm infrastructure for storage, processing and packaging.

83. **The Project is expected to generate mostly positive environmental, social and economic benefits to family farms including PIQCTs**. It may contribute to reduce rural poverty, avoid rural-urban migration and increase the resilience and the coping capacity of these disadvantaged and vulnerable social groups in face of the adverse effects exacerbated by climate change on their livelihoods, food security and well-being. There are, however, a few environmental and social risks. Under Component 1, the project will finance Business Plans proposed by Producers' Organizations in eight priority value chains (milk, fruits, horticulture, cassava, coffee, cacao, honey, non-timber forest products) that are the most relevant for family farms in Mato Grosso. The implementation of these Business Plans may cause limited, temporary and reversible environmental impacts such as erosion, pollution and contamination of soil and/or water from waste and chemicals, or unsustainable use of non-timber forest products, for which preventive and mitigation measures have been identified in the project's draft Environmental and Social Management Framework (ESMF). Additionally, expected improvements in productive outcomes derived from the implementation of Business Plans might inadvertently result in the expansion of production areas over natural habitats, increasing deforestation and environmental degradation, a risk mitigated by the exclusion list (no subprojects with habitat conversion) and sustainability guidance to be provided by rural technical assistants, in addition to other measures defined in the ESMF. On the social side, there are three main risks related with the distinct obstacles that disadvantaged and vulnerable social groups and individuals – a) the poor family farmers;[53] b) the female family farmers;[54] and c) Indigenous Peoples,

[53] Thus, the social assessment carried out under the ESMF shows there is a risk that poor family farmers may be excluded from benefiting from the Project due to the risk of investing their scarce assets in new productive technologies and practices and to commit with the recovery of degraded areas, for which returns may not be fully understood or as fast as they need.

[54] The risk has also been identified that female family farmers may also be excluded from fully benefiting from Project activities and benefits due to traditional barriers that may hamper their participation (invisibility of their economic activities to male-

Quilombolas, and Traditional Peoples and Communities – may face to have an effective participation in project's activities and to get an equitable share of its benefits.[55] The implementation of project activities in remote and hard to supervise areas brings two potential sets of risks: those related to working conditions and the protection of the labor force[56] as well as those related to temporary project induced labor force (such as increased volume of traffic and higher risk of accidents, increased demands on the ecosystem and natural resources, social conflicts within and between communities, fraternization, increased risk of spread of communicable diseases and sexual misconduct).[57] Finally, proper environmental and social risk management may be hampered by the lack of previous experience of the Borrower with the World Bank's Environmental and Social Standards.[58]

84. **To manage these environmental and social risks and considering that the project consists of a series of subprojects (for which risks and impact cannot be defined yet), the Borrower has carried out a first round of consultations with key stakeholders on the project scope and its potential risks and impacts.** Consultations were held with key stakeholders within family farming – including the State Council for Sustainable Rural Development, the State Council for Traditional Peoples and Communities and representative organizations of Indigenous Peoples and *Quilombola* Communities. The feedback from these consultations led to changes in project design – including: i) the redefinition of the criteria for eligibility to the financing of Business Plans;[59] the adoption of two special conditions for participation in the emerging grant window – the option to provide *in kind* counterpart compensation and the waiver of the requirement of leveraging business plan financing from commercial banks – aimed at enabling the participation of poor, disadvantaged and vulnerable family farmers;[60] and iii) the establishment of the earmarked funds for financing Business Plans proposed by Indigenous Peoples, *Quilombolas*, and Traditional Communities, for which "calls of

oriented agricultural extension workers, least control of productive assets, heavy domestic workload, traditional cultural norms, etc.).

[55] Finally, it has been assessed that the goal of reducing the economic marginalization of Indigenous Peoples, *Quilombolas*, and Traditional Communities needs to be adequately balanced with the full respect for: a) their visions of well-being and their aspirations, which may be distinct from mainstream groups in the national society; b) their rights, identity and culture; c) their traditional knowledge about the geographically distinct habitats they are collectively attached to; and d) their natural resource-based livelihoods.

[56] As the support of Business Plans proposed by Producers' Organizations envisages in kind counterpart compensation, work related to core functions of the Project may be provided by community workers and measures have to be taken to ensure that such labor will be provided on a voluntary basis as an outcome of individual or community agreement, will not rely on child labor and will incorporate all measures needed to ensure occupational health and safety measures.

[57] As the civil works to be supported by the project are expected to be of small-scale, the induced labor influx is not expected to affect project areas negatively in terms of public infrastructure, utilities, housing, sustainable resource management and social dynamics. However, it is necessary to consider potential risks of fraternization and sexual misconduct and foresee adequate risk management measures to be incorporated in all bidding documents for hiring contractors.

[58] The Project is not expected to require land acquisition or lead to restrictions on land use. As set in the Project's Environmental and Social Management Framework (and replicated in the Project's Environmental and Social Commitment Plan), the Project's Exclusion List includes the provision that the project will not finance any activities that may directly require land acquisition or impose restrictions on land use. Investments in land regularization will only benefit family farmers who already occupy and use state owned lands. Family farmers will exclusively enroll in environmental regularization activities on a "voluntary basis".

[59] The social assessment has identified that an early criterion of eligibility – the presentation by the family farmers of individual DAPs – constituted a barrier for the participation of many potential beneficiaries (particularly female family farmers, Indigenous Peoples, *Quilombolas*, and Traditional Communities). In response to this finding, the criterion was replaced by the presentation of the DAP of the Producers' Organization.

[60] The social assessment has identified that requiring the payment in cash of the Producers' Organizations/family farmers' counterpart compensation could bar the participation of the worse-off family farmers, whose on-farm incomes are not high enough even for their subsistence needs. This would also be detrimental to female family farmers who are overrepresented among the worse-off family farmers (please refer to Annex # - Gender Action Plan).

proposal" will be further detailed during project implementation and in consultation with these social groups.

85. **Further addressing the environmental and social risks, the Borrower has also prepared:**

- A draft Environmental and Social Management Framework (ESMF) that: a) identifies potential environmental and social vulnerabilities of the areas of intervention, giving special attention to gender and social inclusion issues; b) develops environmental and social screening criteria for subproject selection, which will also be integrated in procurement documents and approved subproject proposals and count with an Exclusion List; c) sets out principles, rules, guidelines and procedures to assess the environmental and social risks and impacts of each project activity; and d) proposes measures and plans to avoid, reduce and mitigate adverse impacts. The Social Impact Assessment developed in the scope of the ESMF has incorporated a gender sensitive lens, paid special attention to distributive impacts on disadvantaged and vulnerable social groups, considered potential impacts of land regularization activities, and assessed the institutional capacity of the Borrower to manage environmental and social needs as well as their capacity building needs. The draft SEP will be disclosed for virtual consultation before Appraisal. Its final version will be disclosed on the dedicated project website within 30 days after effectiveness.
- A draft Stakeholder Engagement Plan (SEP) aimed at ensuring that (i) meaningful consultations with key stakeholders (and particularly, disadvantaged and vulnerable individuals and social groups such as female family farmers, Indigenous Peoples, *Quilombolas* and Traditional communities) occur throughout project implementation; (ii) stakeholders continuously have adequate access to relevant project information; and (iii) stakeholders continuously have access to channels that will facilitate the resolution of concerns and grievances related with environmental and social aspects of the project. These channels to address and respond to project-related grievances will be based on SEAF's sectoral Ombudsman Office, which is integrated to the State Ombudsman Office network. It allows for anonymous grievances and for an appeal process in the case of a complainant that is not satisfied with the response provided. It also includes specific procedures to ensure confidentiality when addressing Gender Based-Violence (GBV) or Sexual Exploitation and Abuse & Sexual Harassment (SEA/SH) complaints and to refer them to service providers for case referrals. SEAF's Ombudsman Office (as well as the ombudsmen of partnering agencies – SEMA and INTERMAT) will receive guidance on how to identify, channel and report on project-related grievances. The draft SEP will be disclosed for virtual consultation before Appraisal. Its final version will be disclosed in the dedicated project website within 30 days after effectiveness.
- A draft Indigenous Peoples Planning Framework (IPPF) aimed at enhancing opportunities for Indigenous Peoples to participate in (through meaningful consultations) and benefit from the project in ways that do not threaten their unique cultural identities and well-being. The draft IPPF proposes a minimal Exclusion List, prohibiting project-financing of Business Plans proposed by IPs' Producer Organizations that: a) have adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation by Indigenous Peoples; b) cause relocation of Indigenous Peoples from land and natural resources subject to traditional ownership or under customary use or occupation; c) have significant impacts on Indigenous Peoples' cultural heritage that is material to the identity and/or cultural, ceremonial, or spiritual aspects of the Indigenous Peoples; and/or d) lead to undesired contacts with Indigenous Peoples "in voluntary isolation," "isolated peoples" or "in initial contact". It also proposes general principles, rules and procedures for disclosing information and carrying out consultations with them as well as for ensuring that their proposals of Business Plans will foster the respect for their human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods, avoid adverse impacts, promote sustainable development benefits and opportunities in a manner that is accessible, culturally appropriate and inclusive, and avoid the emergence or exacerbation of internal conflicts and schisms among the beneficiary IPs. The draft IPPF will be disclosed for

virtual consultation with the relevant stakeholders before Appraisal. Its final version will be disclosed on the dedicated project website within 30 days after effectiveness.

- Labor Management Procedures (LMP) aimed at ensuring appropriate terms and working conditions for project workers. The LMP assesses the potential risks faced by different project workers, sets requirements to ensure project workers' occupational health and safety and to avoid child labor and forced labor. SEA/SH risks (both with regards to female project workers and female members of beneficiary communities) have been assessed as being moderate and the LMP include strict measures (a "code of conduct") to mitigate the risk of sexual exploitation and abuse (SEA)/sexual harassment (SH) or misconduct in the workplace or when engaging with communities. This "code of conduct" will be incorporated as a compulsory rule in all bidding documents for hiring contractors. The project's LMP will be disclosed within 30 days after project Effectiveness.

V. GRIEVANCE REDRESS SERVICES

86. **Grievance Redress.** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank'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 complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's Grievance Redress Service (GRS), please visit *http://www.worldbank.org/GRS*. For information on how to submit complaints to the Bank's Accountability Mechanism, please visit *https://accountability.worldbank.org*.

VI. KEY RISKS

87. **The project's overall risk to achieve the PDO has been defined as Substantial at this stage**. The individual risks are ranked in the Systematic Operations Risk Rating Tool and described below.

88. **Institutional implementation capacity and sustainability risks are rated as Substantial**. The risks associated with the institutional implementation of the project lie on the complexity of its design which will involve and rely on the coordination of several institutions. SEAF will have the role to share coordination, monitoring, and reporting on the project's activities and results with Fundação Uniselva, CGJ, INTERMAT and SEMA, which might incur in additional challenges and risks that will be reassessed and mitigated as the preparation of the operation progresses. To mitigate these risks, a PMU would be established at the SEAF's Cabinet Office with a team including a project coordinator, and senior specialists on financial management, procurement, safeguards and communications. Consultants' support would be hired as needed. The World Bank would support the PMU with training and technical assistance during the implementation of the project.

89. **Fiduciary risk is rated Substantial**. At this stage, the residual Financial Management Risk is assessed as **Substantial**. Currently, the main risks associated with achieving the PDO are: i) the nature of the project design involving

collaboration among multiple agencies (SEAF, CGJ, INTERMAT, SEMA) and ii) SEAF's lack of prior experience with World Bank projects. The Fiduciary risk rating will be reviewed and updated during project preparation, based on new developments and the impact of any mitigation measures that may be taken (e.g. capacity building of fiduciary teams; preparation of the POM which will describe the main fiduciary procedures and controls, etc.). The residual Procurement risk is rated **Substantial**. This rating is rooted in the procurement capacity assessment carried out of the proposed Implementing Agency (IA) (SEAF) and Fundação Uniselva, in the design arrangement to decentralize procurement activities to Producers Organizations (POs) supported by the project and to use Fundação Uniselva to process the section of Individual Consultants. Procurement assessment has reviewed: (i) Internal Manuals and Clarity of the Procurement Process; (ii) Record Keeping & Document Management Systems; and (iii) Contract Management and Administration at central and field levels, (iv) current procurement experience and amounts procured. Most of the issues/risks concerning the procurement function for implementation of the project identified at the moment are weaknesses in the capacity of SEAF's administrative staff to carry out procurement transactions under the Bank's regulations and procedures. The Bank's procurement team will maintain a continuous dialogue with SEAF and Fundação Uniselva to build the procurement documents and processes for the application of all procedures required by Bank's procurement framework, mainly those described in the Procurement Regulations for IPF Borrowers. Mitigation measures will be proposed given the inherent risks in procurement and incorporated the PPSD. Most of the mitigation measures fall within the realm of the Client's actions, but the Bank's team will deliver training, monitor and propose additional mitigation measures if needed. The Client should submit an action plan for the Bank's review, noting its plan to put in place all proposed mitigation measures for this operation.

90. **Integrated environmental and social risks are rated Substantial**. Environmental risks are considered **Moderate** at this time, pending further detailing of the types of activities and subprojects to be financed under the project. At this stage, the main environmental risks are associated to interventions in family farmers' holdings to improve productivity, including small infrastructure, irrigation, agricultural inputs, equipment and tools and other production and processing related support, which may cause limited, temporary and reversible environmental impacts if preventive and mitigation measures are not properly implemented and monitored, such as erosion, pollution and contamination of soil and/or water from waste and chemicals. Strong technical assistance and incentives to sustainable production will be necessary to avoid increased deforestation and environmental degradation. The social risks are rated **Substantial** as the project needs to ensure proper processes of consultation, engagement and benefit sharing for Indigenous Peoples, traditional communities, women and disadvantaged and vulnerable social groups as well as to avoid health and safety risks to which project workers and beneficiary communities may be exposed in remotely located areas. To deal with these potential environmental and social risks, during preparation, SEAF/MT (the implementing agency) will:

- Prepare, disclose and carry out a public consultation of a draft version Environmental and Social Management Framework (ESMF), which will identify potential environmental and social impacts (taking particular consideration of gender and social inclusion aspects as well as potential risks to community safety) and propose standard measures to minimize and mitigate these impacts;

- Prepare, disclose and carry out a consultation with Indigenous Peoples representative organizations of the 43 Indigenous Peoples present in Mato Grosso and other interested parties of a draft version of an Indigenous Peoples Planning Framework (IPPF);

- Prepare, publicly disclose and carry out a public consultation of a draft version of a Stakeholder Engagement Plan (SEP), which will pay special attention to the needs of each disadvantaged and vulnerable group to facilitate the consultation and engagement with these groups as well as to collect their feedback and address in a culturally adequate manner the concerns they may raise;

- Prepare and publicly disclose Labor Management Procedures (LMP) considering and proposing measures to ensure that: a) employment or engagement in connection with the project will proscribe all forms of child or forced labor; b) adequate terms and conditions of employment will be provide to project workers and enforced; c) Occupational Health and Safety measures will be designed and implemented according to best GIIP; and d) contractors adopt and follow a strict Code of Conduct for Workers avoiding SEA/SH behaviors, discrimination, and disrespect for cultural norms and values of the beneficiary communities.

91. **The final versions of these E&S Risk Management instruments will be prepared – incorporating the feedback collected through the consultation process – and disclosed within 30 days after project effectiveness**.

VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Period 3	Period 4	Period 5	Closing Period
Increased access to markets						
Increase in gross value of sales by family farmers participating in approved subprojects (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	0	0	30.00
➢Increase in gross value of sales among women-led family farms participating in approved subprojects (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	0	0	30.00
➢Increase in gross value of sales among youth-led family farms participating in approved subprojects (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	0	0	30.00
➢Increase in gross value of sales among family farmers belonging to PIQCT communities participating in approved subprojects (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	0	0	30.00
Increased climate resilience (improved, climate-smart agriculture practices & technologies)						
Farmers adopting improved agricultural technology (Number) [CRI]						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	2500	0	0	9000.00
➢Farmers adopting improved agricultural technology - Female (Number) [CRI]						
0.00	0	0	500	0	0	1800
➢Farmers adopting improved agricultural technology - male (Number) [CRI]						
0.00	0	0	2000	0	0	7200
➢Farmers adopting improved agriculture technology - youth (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	750	0	0	2,700.00
➢Farmers adopting improved agriculture technology - PIQCTs (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030

0.00	0	0	375	0	0	1,350.00
Improved land and environmental management						
Family farmers benefited with improved environmental and land regularization services (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	2500	6045	9590	11900	12,900.00

Intermediate Indicators by Components

Baseline	Period 1	Period 2	Period 3	Period 4	Period 5	Closing Period
Component 1: Climate-smart economic inclusion						
CSA Family Business Plans prepared and implemented (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	90.00	38	90	116	128.00
➢CSA Family Business Plans led by women (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	6	14	17	19.00
➢CSA Family Business Plans led by youth (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	6	14	17	19.00
➢CSA Family Business Plans implemented in PIQCT communities (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	6	14	17	19.00
Family farmers receiving technical assistance to implement CSA Family Business Plan activities (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	2500	0	0	9,000.00
➢Women family farmers trained (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	500	0	0	1800.00
➢Youth family farmers trained (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	0.00	750	0.00	0.00	2700.00
➢Family farmers belonging to PIQCT communities trained (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030

0.00	0.00	0.00	375.00	0.00	0.00	1,350.00
Increase in the number of new markets accessed by Producer Organizations benefitting under the project (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	0.00	0.00	20.00	0.00	30.00
Percentage of subprojects implementing according to the proposed business plan activities (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	80.00	80.00	80.00	80.00	80.00
Component 2: Improved land and environmental management						
State settlements with geo-referencing finalized (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	10.00	20.00	35.00	35.00	35.00
Number of families in georeferenced State settlements with finalized occupational inspection reports due to project support (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	0.00	545.00	1090.00	1,900.00	1,900.00
Number of families in the State settlements that receive land regularization titles due to project support (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	0.00	0.00	370.00	742.00	1,300.00
➢Number of land regularization titles issued in the name of women due to project support (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	55	110	195
Family farming establishments with validated Rural Environmental Registry (CAR) under the Brazilian Forest Code due to project support (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	2,500.00	5,500.00	8,500.00	10,000.00	11,000.00
Reduction in the average number of days between family farmer submission to CAR and validation of CAR (Days)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
730.00	730.00	180.00	180.00	180.00	180.00	180.00
Subprojects with carbon balance assessment of primary production (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0	0	0	0	0	10.00
Anthropological Reports in Quilombola communities prepared by the project (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	5.00	15.00	30.00	40.00	40.00
Component 3: Project management and coordination						

Number of families directly benefitting under the project. (Number)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	2,000.00	7,200.00	12,000.00	13,500.00	15,000.00
Beneficiaries satisfied with services received under the project (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	80.00	80.00	80.00	80.00	80.00
➢PIQCT beneficiaries satisfied (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	80.00	80.00	80.00	80.00	80.00
➢Women beneficiaries satisfied (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	80.00	80.00	80.00	80.00	80.00
➢Youth beneficiaries satisfied (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	0.00	80.00	80.00	80.00	80.00	80.00
Complaints and inquiries received through the Grievance Redress Mechanism recorded and resolved effectively (Percentage)						
Dec/2023	May/2025	May/2026	May/2027	May/2028	May/2029	May/2030
0.00	100.00	100.00	100.00	100.00	100.00	100.00
Component 4: Contingency Emergency Response Component						

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Increase in gross value of sales by family farmers participating in approved subprojects	The indicator will measure, in real terms, the increase in gross value of sales by family farmers participating under component 1.	The indicator will be measured once at project beginning	Project data collection as part of project M&E approach.	The increase in gross value of sales will be measured for families participating in the subprojects as compared to a control	SEAF

		(baseline), once at midterm (MTR), and once at project closing (evaluation).		group. A baseline study will be carried out to determine the gross sales value before the project interventions. The survey will be repeated in the Mid-Term and Final Evaluation. The indicator value will be adjusted for inflation (using the Extended National Consumer Price Index - IPCA).	
Increase among women-led family farms participating in approved subprojects					
Increase among youth-led family farms participating in approved subprojects					
Increase among family farmers belonging to PIQCT communities participating in approved subprojects	PIQCT refers to Indigenous Peoples and other Traditional People and Communities				
Farmers adopting improved agricultural technology	This indicator measures the number of farmers (of agricultural products) who have adopted an improved agricultural technology	This indicator will adapt the core results indicator to measure the	Project data collection as part of project M&E approach.	The increase in gross value of sales will be measured for families participating in the subprojects as	SEAF

	promoted by operations supported by the World Bank.	number of family farmers adopting improved, **climate-smart** agriculture practices and technologies under component 1. The indicator will be measured at MTR and at project closing (impact evaluation).		compared to a control group. The Mid-Term and Final assessments will track the number of beneficiaries who effectively adopt the practices for at least 1 year.	
Farmers adopting improved agricultural technology - Female					
Farmers adopting improved agricultural technology - male					
Farmers adopting improved agriculture technology - youth					
Farmers adopting improved agriculture technology - PIQCTs	PIQCT refers to Indigenous Peoples and other Traditional People and Communities				

Family farmers benefited with improved environmental and land regularization services	This indicator will measure the number of family farmers receiving support for land and environmental regulation activities under component 2. The target is composed of the beneficiaries of the 11,000 CARs (environmental regularization) added to the 1,700 beneficiaries with finalized occupational inspection reports (land regularization).	Annual	Project Monitoring System, INTERMAT and SIMCAR.	Survey of beneficiaries and site visits, with data to be consolidated as part of project M&E at SEAF. Tracking of the indicator will account for the number of families that received actions related to land and environmental regularization, without double counting.	SEAF, INTERMAT, SEMA

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
CSA Family Business Plans prepared and implemented	This indicator will measure the number of business plans that have concluded their physical implementation.	Annual	Data will be collected through site visits and integrated into the project M&E system.	SEAF will collect and consolidate data in a project database of business plans submitted, approved, and their implementation status.	SEAF
CSA Family Business Plans led by women					
CSA Family Business Plans led by youth					

CSA Family Business Plans implemented in PIQCT communities	PIQCT refers to Indigenous Peoples and other Traditional People and Communities				
Family farmers receiving technical assistance to implement CSA Family Business Plan activities	This indicator will measure the number of project beneficiaries receiving technical assistance to implement activities included in CSA Family Business Plans under component 1. Technical assistance will focus on adoption of climate-smart agriculture practices to improve climate resilience together with other good practices related to production, environmental compliance, and agribusiness.	Annual	Participation data will be collected at technical assistance visits and integrated into the project M&E system.	Participation registration will be done by the Cadastro de Pessoa Fisica (CPF) so as not to overestimate the participation of beneficiaries.	SEAF
Women family farmers trained					
Youth family farmers trained					
Family farmers belonging to PIQCT communities trained	PIQCT refers to Indigenous Peoples and other Traditional People and Communities				
Increase in the number of new markets accessed by Producer Organizations benefitting under the project	This indicator will measure the percentage increase in the number of markets to	Annual	Data will be collected through	Data will be collected from POs participating under both windows 1	SEAF

	which Producer Organizations benefitting under the project are selling.		beneficiary surveys and site visits and integrated into the project M&E system.	and 2 under component 1.	
Percentage of subprojects implementing according to the proposed business plan activities	This indicator evaluates whether subproject activities are carried out in accordance with the business plan.	Annual	Data will be collected through beneficiary surveys and site visits and integrated into the project M&E system.	Criteria for evaluating this indicator will follow the protocol for monitoring the implementation of business plans established in the MOP. This indicator will be measured from the second/third year onwards, when the first business plans begin implementation.	SEAF
State settlements with geo-referencing finalized	This indicator will measure the number of State Settlements that receive support to undertake a critical component of the land regularization process: geo-referencing.	Annual	INTERMAT database of State settlements and their status of land regularizatio n, to be incorporated into the	State settlement survey and site visits.	INTERMAT, SEAF

			project M&E system.		
Number of families in georeferenced State settlements with finalized occupational inspection reports due to project support	This indicator will measure the number of families (family farmers) in georeferenced State Settlements targeted by the project that have had their Occupational Inspection Reports carried out and finalized, a critical component of the land regularization process.	Annual	Survey of state settlements and site visits, to be incorporated into the project M&E system.	Progress toward this indicator will only be counted where the State settlement has already completed the geo-referencing process.	INTERMAT, SEAF
Number of families in the State settlements that receive land regularization titles due to project support	This indicator measures the number of families (family farmers) with land titles issued with support from INTERMAT in the State settlements targeted by the project. The 1,300 beneficiaries are a subset of the 1,700 that will have finalized occupational inspection reports, which are required to have for the land titles to be issued.	Annual	Survey of state settlements and site visits, to be incorporated into the project M&E system.	INTERMAT, SEAF	
Family farming establishments with validated Rural Environmental Registry (CAR) under the Brazilian Forest Code due to project support	This indicator will measure the number of family farmers with a validated CAR supported by the project.	Annual	SEMA information system (SIMCAR), which will	Beneficiary survey and site visits.	SEMA, SEAF

			form part of project M&E at SEAF		
Reduction in the average number of days between family farmer submission to CAR and validation of CAR	This indicator will measure the average reduction in time needed for SEMA to validate entries to CAR submitted by family farmers.	Annual	SEMA information system (SIMCAR), which will form part of project M&E at SEAF	Tracking of time between entry and validation of CAR in SIMCAR	SEMA, SEAF
Anthropological Reports in quilombola communities prepared by the project	This indicator will measure the number of Anthropological Reports prepared for quilombola communities under the project.	Annual	The data will be reflected in the project M&E system,	Data will be collected by SEAF and integrated into the project M&E system.	SEAF
Subprojects with carbon balance assessment of primary production	This indicator will measure the number of subprojects under component 1 that complete assessments of the on-farm carbon balance of primary production activities (crops, livestock, vegetation). The assessments will also estimate the economic and financial return on mitigation interventions. Value chain-appropriate	Carbon balance assessment to be undertaken once per subproject.	On-farm data collection and reliance on figures from the literature (e.g. emission factors) where necessary. Data collected to	To be determined according to the carbon balance assessment tool used.	SEAF, SEMA

	tools will be utilized for each subproject e.g. for dairy activities, the interactive version of the Global Livestock Environmental Assessment Model (GLEAM-i) may be used. For each estimation, a "with" and "without" project scenario will be generated, enabling estimation of project contributions to carbon balance changes.		be included in project M&E at SEAF for subproject monitoring.		
Number of families directly benefitting under the project.	This indicator will measure the number of families (family farms) benefitted directly by the project, under both components 1 and 2. The target takes into account the fact that an estimated 6,700 family farmers are expected to benefit under both component 1 and component 2 to avoid double counting.	Annual	ProjectSA	SEAF	
Beneficiaries satisfied with services received under the project	This indicator will measure the percentage of beneficiaries reporting as satisfied with services - including technical assistance and training	The indicator will be evaluated twice at MTR and in	Beneficiary survey.	The survey will cover beneficiary satisfaction to the major lines of services and assistance provided by the project: technical	SEAF

	under component 1 and land and environmental regularization services under component 2 - received under the project.	the final project evaluation.		assistance and training under component 1 and land and environmental regularization services under component 2.	
PIQCT beneficiaries satisfied	PIQCT refers to Indigenous Peoples and other Traditional People and Communities				
Women beneficiaries satisfied					
Youth beneficiaries satisfied					
Complaints and inquiries received through the Grievance Redress Mechanism recorded and resolved effectively	This indicator will measure the percentage of complaints and inquiries received through the project's Grievance Redress Mechanism that are recorded and resolved in a professional and timely manner.	Annual	Data collected through the Project Grievance Redress Mechanism	Complaints will be received and recorded through the project Grievance Redress Mechanism. A qualitative evaluation of the resolution for each complaint will be included in project M&E.	SEAF

ANNEX 1: Implementation arrangements and support plan

1. **Borrower and implementing agency**. The State of Mato Grosso will be the Borrower for the loan, with the Federative Republic of Brazil serving as the Guarantor. The Secretariat of Family Agriculture (Secretaria Estadual de Agricultura Familiar – SEAF) will be the project implementing agency. SEAF will have the overall responsibility for the implementation of the project, including ensuring that sufficient counterpart resources to implement the project are foreseen in Mato Grosso's budget.

2. **Institutional arrangements**. Three institutions will assist SEAF to carry out specific project activities under component 2: INTERMAT, CGJ, and SEMA:

   (a) **INTERMAT** implements land policy and manages cartographic information in Mato Grosso, contributing to sustainable regional planning and development. Under Subcomponent 2.1, INTERMAT will supervise georeferencing activities and implementation of occupational surveys and processing of land titling for the selected Settlements.

   (b) The **Mato Grosso General Comptroller of Justice Office (CGJ)** regulates and inspects the notarial offices (cartórios), used for land registration, and mediates potential land conflicts. Under subcomponent 2.1, CGJ will support the land regularization processes for project beneficiaries and mediate potential land conflicts, including *inter alia* coordinating and monitoring the team of specialists hired to support SEAF and INTERMAT on land governance and promoting the exchange of knowledge among the Justice Department of Mato Grosso, SEAF, and INTERMAT.

   (c) The **Mato Grosso State Secretariat for the Environment (SEMA)** is responsible for environmental control, preservation, conservation, and recovery in Mato Grosso, as well as implementing environmental policies including the Brazilian Forest Code. Under subcomponent 2.1, SEMA will carry out the environmental regularization activities of the project. Under subcomponent 2.2, SEMA will support SEAF to identify high incidence of deforestation and forest fire in family farming areas.

3. Once the project is effective, SEAF will enter into Cooperation Agreements with INTERMAT, CGJ, and SEMA. The Cooperation Agreements will set out the obligations of each institution to assist in carrying out their respective project activities.

4. SEAF will also recruit ***Fundação Uniselva***[61] as a procurement agent, under a Procurement Agent Agreement, to assist in hiring staff for the PMU and partner institutions and to provide technical assistance and small-scale procurement services for subprojects. The fiduciary capacity of Fundação Uniselva was assessed during project appraisal as acceptable to the Bank. The Fundação Uniselva contract will be financed with the counterpart funds of Mato Grosso.

5. **Project management**. A **Project Management Unit (PMU)** will be established within SEAF. The PMU will be responsible for the management and coordination of project activities including all of the project's fiduciary, safeguards, and monitoring and evaluation aspects, at both central and field levels. The PMU will also be responsible for project communications and stakeholder engagement. SEAF will guide the PMU to collaborate with the other State Secretariats and agencies assisting project implementation as well as those that are active in areas relevant to the

[61] Fundação Uniselva is a non-profit private law entity, created by Law No. 8.958/94, with the objective to provide executive, administrative and financial management support to public entities to execute their projects.

project.[62] Establishment of the PMU is a condition of effectiveness. The PMU will be staffed with key managerial and technical positions in accordance with the timelines and Terms of Reference included in the Project Operations Manual (POM).

6. The PMU will submit semiannual reports to the Bank covering the planned actions including selected business initiatives, status of implementation, outcomes, financial statements, procurement plans, environmental and social issues, and actions taken to ensure satisfactory implementation. These reports will be shared with Consultative Committee members to facilitate effective project management, reformulation of project strategy, if needed, and dissemination of experiences.

7. The PMU will implement the project in accordance with the POM, which shall include the rules, methods, guidelines, standard documents and procedures for the carrying out of the project, including the following: (a) the procedures for the implementing, monitoring and evaluation of the project (including the technical, procurement, disbursement, financial management, social and environmental requirements thereof); (b) the eligibility criteria for the selection of producer organizations; (c) detailed social, economic, financial, technical and environmental criteria for the evaluation and ranking for selecting Subprojects; (d) the functions, responsibilities, structure and key staff composition of the UGP; (e) model forms of Subproject Agreements; (f) indicators to be used for project monitoring and evaluation; and (g) the Safeguard Documents. Adoption of the POM, satisfactory to the Bank, is a condition of effectiveness.

8. Once the project is effective, a **Consultative Committee** will be established to provide inter-agency coordination and oversight of project activities. The Consultative Committee will be chaired by SEAF and composed of representatives of all entities involved in project implementation, including INTERMAT, CGJ, SEMA, EMPAER, PCI, the Governor's Office (Casa Civil), and SEFAZ. The Consultative Committee will convene regularly to report on progress and identify key actions needed to support project implementation. (See Figure 1.)

9. Component 1 will be furthermore supported by a **Subproject Evaluation Committee**, composed of, *inter alia*: (i) relevant value chain specialists; (ii) environmental and social specialists; (iii) one financial specialist; (iv) one procurement specialist; and (v) representatives from SEAF, INTERMAT, CGJ, SEMA, and EMPAER. The Committee will undertake the following activities under subcomponent 1.1: (i) issue public calls for proposals, including detailed eligibility criteria; (ii) after each public call for proposals, review, evaluate, and select those proposals to be developed into CSA Family Farming Business Plans; (iii) for each round of Business Plan submissions, review, evaluate, and select those to be approved for implementation. Evaluations and selections undertaken by the Committee will follow the eligibility and selection criteria for each of the following 2 windows (below) as will be set forth in detail in the POM. Final decisions made by the Committee will be ratified by the Consultative Committee and made publicly available.

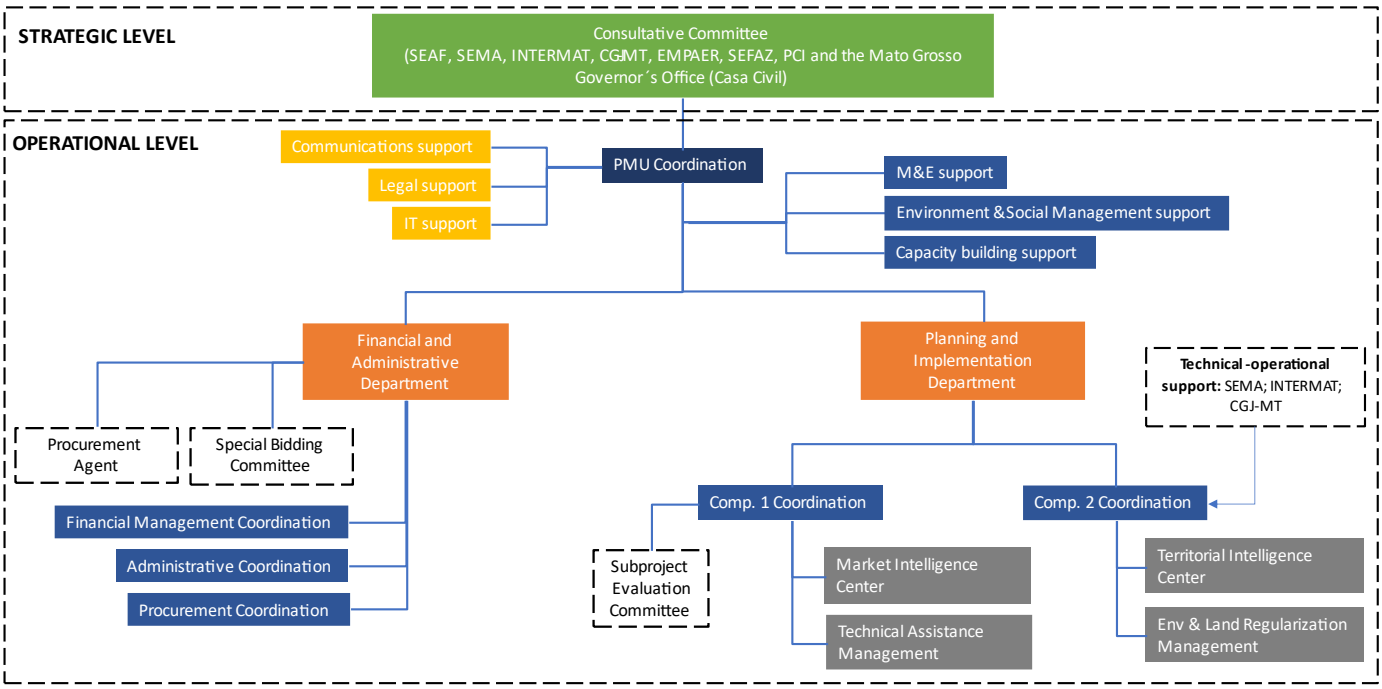
   i. "Commercial" family farming POs: formal, well-structured, and experienced POs and family farmer members with active and regular activity in formal markets;

   ii. "Emerging" family farming POs: formal POs and family farmer members with technical potential to achieve a considerable surplus production, but with surplus production currently deficient due to low productivity, poor organization and management, or deficient production quality standards.

[62] These are: the Land Institute of Mato Grosso (Instituto de Terras de Mato Grosso, INTERMAT); Mato Grosso Secretariat for the Environment, Secretaria de Estado de Meio Ambiente, SEMA); Mato Grosso General Comptroller of Justice Office (Corregedoria Geral de Justiça de Mato Grosso, CGJ); State Research, Assistance and Rural Extension Company of Mato Grosso (Empresa Mato-grossense de Pesquisa, Assistência e Extensão Rural, EMPAER); Produce, Conserve and Include Strategy (Strategia Produzir, Conservar e Incluir, PCI).

10. **Producer/Family Farmers Organizations (POs)** will be required to comply with the eligibility criteria set out in each call for proposals. Those POs with CSA Family Farming Business Plans approved for financing will sign a Subproject Agreement with SEAF, as set out in the POM. The POs will be responsible for implementing the Business Plans in collaboration with the PMU and hired consultancies.

Figure 1: Implementation arrangements for Mato Grosso Produtivo



Financial Management.

11. The PMU will be responsible for the management and coordination of project activities including all of the project's fiduciary-related responsibilities, following the POM, which will reflect the detailed staff duties, procedures, and guidelines for disbursements, payments, approvals, commitments, and reporting.

12. SEAF will recruit ***Fundação Uniselva***[63] as a procurement agent, under a Procurement Agent Agreement, to assist in hiring staff for the PMU and partner institutions and to provide technical assistance and small-scale procurement services for subprojects. The Support and Development Foundation of the Federal University of Mato Grosso (Uniselva Foundation) was created by a group of professors from the Federal University of Mato Grosso ("UFMT – Universidade Federal de Mato Grosso") and was registered on December 17, 2001, in the 1st Notary and Registry Service of Cuiabá, Book 327 – Sheets 179 – 185, under Protocol No. 293482 – Registration No. 5481. Installed on June 10, 2002, its purpose is to support the development of teaching, research, extension, institutional development, scientific, technological, and innovation projects through the administrative and financial management necessary for the execution of these projects. The fiduciary capacity of "Fundação Uniselva" was assessed and considered satisfactory.

[63] Fundação Uniselva is a non-profit private law entity, created by Law No. 8.958/94, with the objective to provide executive, administrative and financial management support to public entities to execute their projects.

13. **Staffing**. Not later than three months after loan effectiveness, two fully dedicated Financial Management staff should be appointed at SEAF to undertake all FM-related tasks and to ensure segregation of functions, as to be detailed on the POM. The FM staff should be trained in all the necessary government budget, accounting, administrative rules, and procedures and attend all fiduciary training provided by the World Bank throughout project implementation.

14. Uniselva: Uniselva's current accounting and financial areas have eight professionals (2 Accounts Payable, 1 Revenue Analyst, 2 Accounting Analysts, 1 Accountant, 1 Assistant and 1 Accounting Manager). Uniselva's personnel are hired under the CLT[64] Labor Laws type of contract, and the average of employment is six years. The current staff supports approximately 350 projects in the state of Mato Grosso – a total of R$ 304 million. As a result of this project, Uniselva has communicated that it will initiate the hiring process of ten additional professionals exclusive to the project: 1 Legal, 2 Administrative, 3 Finance, 1 Information Technology and 3 Project Management, so the staff is trained once the project is approved. Not later than three months after loan effectiveness, two fully dedicated Financial Management staff should be appointed at Uniselva to undertake all FM-related tasks and to ensure segregation of functions, as to be detailed in the POM. The FM staff should be trained in all the necessary government budget, accounting, administrative rules, and procedures and attend all fiduciary training provided by the World Bank throughout project implementation.

15. **Planning and Budgeting**. The budget cycle includes planning and implementing all government activities, which reflects in the PPA, LDO, and LOA.[65] The State's budget process is clearly defined, follows Law 4.320/64, and the budget and financial accounting frameworks align with Brazilian regulations.

16. For FY 2023 the project will be executed through program 4168 – "Desenvolvimento das Cadeias Produtivas da Agricultura Familiar" or Development of Family Farming Productive Chains with an approved budget for FY 2023 of R$ 16.3 million (equivalent to USD 3.3 million). If needed, supplementary additional budget may be approved throughout the year. The project intends to execute approximately USD 1.0M for FY 2023. By May 31st, 2023, the PPA 2024-2027 will also be adjusted to reflect the project. By July 31st, 2023, SEAF will ensure that the PLOA[66] for FY24 reflects the project under a specific (PAOE).

17. For 2023, the loan proceeds will be accounted within the FIPLAN system through: i) item 6 – the current program's identification that will be used to account for this project's transactions: 4168 - Mato Grosso Sustainable Development of Family Farming Project, and item 9 – the origin of sources[67] through the category expense no. "1.754.0000"- where 1 stands for the current year, 754 stands for resources originating from credit operations and the 0000 – which will be used to identify the contract number for this operation once the contract has been signed with the World Bank.

18. In parallel, the SAFF[68] (Solution for Physical and Financial Project Management system) will also be used to manage the project. This system will be utilized for monitoring and reporting purposes (i.e. including the generation of IFRs reports). The reports are generated using the Business Intelligence (BI) tool which is built in the SAFF system. The new web-based version of the SAFF system allows the online consultation of the information and access will be made available to all project executors. Not later than three months after loan effectiveness, the Borrower shall have the

[64] "Consolidação das Leis do Trabalho" – CLT.
[65] PPA–Plano Plurianual, LDO-*Lei de Diretrizes Orçamentárias*, LOA–*Lei Orçamentária Anual* which includes the Government's goals and programs that are approved by State Legislative Branch every four years (PPA) and annually (LDO and LOA).
[66] PLOA – Projeto de Lei Orçamentária Anual or "Anual Budget Bill" submitted by the Executive Power to Congress, including the proposal for next year's budget for total estimated income and expenses.
[67] Per "Portaria no. 710, 25 de fevereiro de 2021" which establishes the classification of sources or destinations of resources to be used by States, Federal District and Municipalities.
[68] "Solução para Administração Física e Financeira de Projetos – SAFF"

SAFF operating in a manner acceptable to the Bank and thereafter maintain it operational throughout project implementation. All project transactions will be booked in the FIPLAN state system, and the SAFF system. The project's transactions from FIPLAN and SAFF systems will be monthly reconciled by the PMU.

19. Uniselva: The project will follow Uniselva's budget cycle, followed by all units belonging to UFMT.[69] The Foundation's financial year coincides with the calendar year, ending December 31st of each year. The budget cycle of Uniselva has four phases: 1) the preparation and submission of the budget, 2) the budget approval, 3) the budget execution, and 4) the budget evaluation. By October of each year, the General Director must submit the budget proposal for the following year. The Board of Trustees has forty-five days to analyze and approve the budget proposal. Once the budget has been approved or the deadline has elapsed without any comment by the Council, the Foundation's budget execution is authorized.

20. Uniselva will utilize the "Business Process Modeling (Bizagi Modeler)" project management software to map all the budget activities and the necessary processes for effective project implementation. The process starts receiving the documentation required (upon approval by the Executive Board) by the financier. The project activities are entered into the system, resulting in a preliminary budget plan. This plan is submitted for the financier's review and approval. Once the plan is approved, it formalizes a legal instrument and opens a specific bank account (exclusive for the project). At this phase, an analyst from the Monitoring Center for the Project Management Area is assigned to carry out negotiations with the coordination of the respective project, aiming to deal with the initial guidelines, planning, and other necessary referrals to start the execution, such as the hiring of personnel, procurement, inputs presentation of the system, the establishment of a communication channel, frequency of monitoring, work schedule, etc. Within one month after loan effectiveness, Uniselva will forward to the Bank's review the project number added to the Bizagi Modeler software. In addition, the respective project number and its details should be included in the POM for follow-up budget execution.

21. SEAF's budget figures for the total project for Component 3 – Personnel include a total amount of USD 2.5M (equivalent to R$ 13.4M[70]) related to the administrative fee Uniselva will receive for its rendered services. The legal instrument is being prepared by Uniselva and SEAF.

22. **Accounting**. The Federal Government published Decree no. 10.540/2020, which established additional mandatory guidelines for the article of Complementary Law no. 101 of 2000, which dealt with minimum requirements for the accounting and control systems of budgetary and financial execution and established the need to elaborate and publish an action plan to migrate to the new standards by the year 2023. The project's documented financial reporting responsibilities are being fulfilled (specifying what reports are to be prepared, when they are ready, periodicity of preparation, and content). The accounting system maintains the standards acceptable according to the Bank guidelines. All transactions under the project will be accounted for on a cash basis for disbursements, reporting, and auditing purposes.

23. The States' integrated Planning, Accounting and, Finance system of the state of Mato Grosso is FIPLAN – "Sistema Integrado de Planejamento, Contabilidade e Finanças do Estado de Mato Grosso." The state's system provides adequality account for and control transactions and records in real-time and individually. It includes detailed information on the budgetary and financial execution of the budget units, referring to revenue and expenditure and other transactions that affect or may affect the entity's financial performance and financial position.

[69] "UFMT – Universidade Federal de Mato Grosso" or Federal University of Mato Grosso
[70] Based on a maximum of 10% of the total hiring personnel

24. The State of Mato Grosso follows: (i) the NBC TSP, which represents the adoption of IPSAS in Brazil; (ii) Law N. 4.320/64, which established certain high-level accounting principles related to budget and accrual accounting; and (iii) the MCASP, issued under Law 10.180 of February 6, 2001. To establish a gradual implementation of the accounting reforms in a complex design with so many institutions and federation arrangements and to follow the guidelines of STN Ordinance nº. 634/2013, STN edited the PIPCP, which is a detailed IPSAS implementation plan ("Plano de Implantação dos Procedimentos Contábeis Patrimoniais – PIPCP"). In preparing the PIPCP, observing national and international experiences, establishing a gradual logic, and the broad participation of the agents involved, including the Federal Court of Auditors, were considered. The involvement of these agents was carried out through meetings, debates within the scope of established technical groups, dialogue with federation representatives, and conducting a comprehensive public consultation. Currently, the state is observing the agreed PIPCP schedule expected to be fully implemented by 2023[71]. Although the Bank is not financing any PIPCP activity, it will follow up on its implementation throughout the project's life as it is directly related to the achievement and sustainability of the Project Development Objectives.

25. Uniselva: Uniselva is a Brazilian non-profit organization that follows the Brazilian Accounting Rules (NBC), under Law 6.404/76, 11.638/07 and ITG 2002 - Non-Profit Entities, NBC TG 1000 – Accounting for Small and Medium Size Companies (CPC PME), or the complete standards (IFRS) also apply in those aspects not covered by this interpretation.

26. The project accounting/financial system will account for all project transactions. The information previously input to the Project Management Software (Bizagi Modeler) is also registered in this accounting/financial system. This accounting/financial system was developed by the Support Foundation for Technology and Science – FATEC, Support Foundation of the Federal University of Santa Maria/Rio Grande do Sul, whose source code became the property of Uniselva Foundation.

27. All maintenance of auxiliary registers related to the project is done in this application, such as workforce, types of funding sources, executing unit, functions within the project, linked institutions, customer registration, etc. The maintenance is done internally by the IT Area. The system will also be accessible to the SEAF's finance team/PMU as "ready only. Within one month after loan effectiveness, Uniselva will provide "read-only system access" for the PMU-SEAF.

28. The current chart of accounts will be sufficient for all the project's transactions. However, the Gerência system must be adjusted to incorporate the reporting requirement from the Bank – i.e., by category, component, and sub-component. Within one month after loan effectiveness, Uniselva will include the project in the Gerência system.

29. **Internal Control/Internal Audit**. All project budgeting and accounting transactions will be processed through FIPLAN/MT. The first stage of the expenditures is the commitment (empenho) which is approved by the PMU, acquisition, verification, and certification (liquidação); and final payment (pagamento) is made by SEAF/MT. The approval and authorization controls are adequate to approve and make the necessary payments per the State's regulations. This process should be included in the POM. Monthly, all project transactions will be reconciled with the budget and procurement reports. A draft of the POM should be forwarded to the Bank for non-objection before Negotiations.

30. SEAF and Uniselva will ensure that all the projects' assets acquired with the loan's funds will be accounted for. The PMU will ensure (for the whole time of project implementation) that there is a control in place that guarantees all

[71] Out of on nineteen accounting procedures, thirteen are fully implemented, two are partially implemented, and four have not been initiated. No delays are expected.

purchased assets by each implementing agency are: i) used only for the project's activities; ii) listed in an inventory record; iii) each asset is given an individual master record and number (i.e., recorded as an individual asset and depreciated according to its individual useful life); iv) the asset has the necessary insurance; v) physical inventory control is performed annually for these assets and reconciled with the respective control accounts; and vi) the asset is maintained in good condition. The project's assets will be protected from fraud, waste, and abuse. Assets purchased will be listed in an inventory record using the SIGPAT system[72] which is integrated to the FIPLAN-MT system. And for Uniselva, the asset will be booked in the Gerência system. Each asset is given an individual master record and number. Physical inventory control is performed at the end of each fiscal year for these assets and reconciled annually with the respective control accounts. The PMU will ensure to include in the POM the detailed procedures and guidelines for acquiring project's assets using Bank's resources.

31. The CGE-MT ("Controladoria Geral do Estado de Mato Grosso") is the unit responsible for supporting the State's direct and indirect agencies on legal procedural compliance for contracting public expenditures and complying with the public information access law. CGE-MT is also responsible for internal auditing-related functions and specific aspects of internal control and for coordinating, executing, evaluating, supporting, and guiding the activities inherent to the internal control of the Executive Branch of the State of Mato Grosso, according to the State's Constitution, which established the Integrated System of Internal Control of the Executive Branch of the State of Mato Grosso.

32. The CGE-MT will implement the Internal Audit Capability Model (IA-CM)[73], issued by the Institute of Internal Auditors (IIA), to strengthen the internal audit functions in all entities that execute the State budget. IA-CM is a framework that identifies the fundamentals needed for effective internal auditing in the public sector and intends to ensure that the internal audit becomes an integral component of effective governance in the public sector and helps organizations achieve their objectives and account for their results. IA-CM consists of five levels, tied to leading practices, and level 3 (integrated) is where internal audit management and professional techniques are uniformly applied following international procedures. Through the project "Progestão – Mato Grosso" supports the government's effort to achieve Level 3 of IA-CM by MTR - Midterm Review[74]. Although the Bank is not financing (through this project) any activities towards the achievement of Level 3, it will follow up on it throughout the project's life, as it is directly related to the achievement and sustainability of the project Development Objectives.

33. It is expected that the internal audit department in the CGE-MT evaluates the adequacy and effectiveness of internal control in the project implementing agencies throughout project implementation. The project will be included in the Annual Audit Plan and the PAINT system within one month after loan signing.

34. Uniselva: All project budgeting and accounting transactions will be processed through the Project Management Software – Bizagi Modeler and the Gerência accounting/financial systems. The first stage of the expenditures is the commitment approved by Uniselva, followed by the acquisition, verification, and certification, and Uniselva makes the final payment. The approval and authorization controls are adequate to approve and make the necessary payments per the institution's regulations. This process should be included in the POM. A draft of the POM should be forwarded

[72] SIGPAT – "Sistema Integrado de Gestão Patrimonial" or Asset Management System

[73] Internal Audit Capability Model (IA-CM): an internationally recognized framework that identifies the foundations necessary for effective internal auditing to meet the organization's management needs and the professional expectations of the role (CONACI – "Conselho Nacional de Controle Interno" or National Board of Internal Control).

[74] According to CGE's status of the implementation of the IA-CM and the Action Plan, there are two KPAs (3.6 – Risk Base Audit and 3.9 – Cost Information) that needs to be completed by CGE-MT to achieve level 3. KPA – Key Process Areas: a total of forty-one KPAs, which defines the technical-operational maturity of an internal audit unit, taking into consideration the way in which it establishes, implements, measures, controls and improves its processes and practices.

to the Bank for non-objection before Negotiations.

35. As the result of this project, Uniselva decided to establish an Internal Audit department within its organization, which implementation will be carried out through a process guided by the Internal Audit of UFMT ("Universidade Federal de Mato Grosso"). Uniselva will include the project in its annual audit plan, with the supervision of the Internal Audit department of UFMT. The alteration of Uniselva's organization chart and the internal audit plan of Uniselva must be approved by the Board of Trustees of the Foundation by July 2023. Uniselva will notify the Bank that the establishment of the Internal Audit department was approved and its timeline. The project will be included in the Annual Audit Plan – PAINT by August 31, 2023.

36. Uniselva, through the PMU, will submit to the Bank an electronic copy of the Internal Audit Report (including the executive summary and the auditor's findings and recommendations for the institution and the project). This report should be submitted to the Bank annually (through the PMU/SEAF), not later than thirty days after its issuance, throughout the life of the project. The Bank will review it and should be used as input for the external auditor's work.

37. **Anticorruption Arrangements**. Borrower Actions to Prevent and Combat Fraud and Corruption in connection with the Use of Loan Proceeds. In furtherance of the above-stated purpose, the Borrower will:

    (i) take all appropriate measures to prevent Fraud and Corruption in connection with the use of Loan proceeds, including (but not limited to) (a) adopting appropriate fiduciary and administrative practices and institutional arrangements to ensure that the proceeds of the Loan are used only for the purposes for which the Loan was granted, and (b) ensuring that all of its representatives involved with the project, and all recipients of Loan proceeds with which it enters into an agreement related to the project, receive a copy of the Bank's IPF Anti-Corruption Guidelines and are made aware of its contents;

    (ii) immediately report to the Bank any allegations of Fraud and Corruption in connection with the use of Loan proceeds that come to its attention;

    (iii) if the Bank determines that any person or entity referred to in (i) above has engaged in Fraud and Corruption in connection with the use of Loan proceeds, take timely and appropriate action, satisfactory to the Bank, to address such practices when they occur;

    (iv) include such provisions in its agreements with each recipient of Loan proceeds as the Bank may require giving full effect to the Bank's IPF Anti-Corruption Guidelines;

    (v) cooperate fully with representatives of the Bank in any investigation into allegations of Fraud and Corruption in connection with the use of Loan proceeds; and

    (vi) if the Bank declares any recipient of Loan proceeds ineligible take all necessary and appropriate action to give full effect to such declaration.

38. **Funds Flow and Disbursement Arrangements**: The disbursement methods used under this project will be based on the Disbursement Guidelines for IPF, dated February 2017. The proposed funds flow, and disbursement arrangements are streamlined within the proposed project to facilitate execution, avoid unnecessary incremental operational arrangements, and rely on the existing country's public financial management systems as much as possible. SEAF will make all payments for all components using the FIPLAN-MT system once payment obligations have been incurred, verified, and adequately documented. For payments to be made, the system requires that funds be committed by

source, making possible tracking of loan disbursements to the proposed project expenditures. The disbursement of project funds will be processed following the World Bank's procedures as stipulated in the Legal Agreement and Disbursement and Financial Information Letter (DFIL).

39. The following disbursement methods may be used to withdraw funds: (a) reimbursement, (b) advance, and (c) direct payment, with the advance method being the primary disbursement method.

40. SEAF/MT will open a segregated DA[75], in Banco do Brasil, in Cuiabá, in the name of the "Secretaria de Estado de Agricultura Familiar do Estado de Mato Grosso" within one month after loan effectiveness, to receive loan funds in USD. An operational account, exclusive to the project, will also be opened, in Reais, for further payments to the suppliers and contractors in local currency. Withdrawal applications and supporting documentation will be submitted to the World Bank electronically through the Client Connection website.

41. Retroactive financing will not be allowed for this project.

42. The project has informed that the front-end-fee will not be financed from the Loan Proceeds.

43. The minimum application size for direct payments and reimbursements will be US$500,000 equivalent. The project will also have four months after the closing date to document expenditures incurred before the closing date.

44. The Designated Account (DA) ceiling will be variable based on the forecast needed for six months' period, recalculated every three months. Direct Payments will be documented by records (copies of the invoices).

45. SEAF (including the subprojects/matching grants) and Uniselva will report the use of the Advances and Reimbursement requests through Statement of Expenditures (SOEs). A customized SOE has been agreed with SEAF (for the reporting of the transfer of funds for the subprojects/matching grants). The frequency for reporting eligible expenditures (including the Statement of Expenditures) paid from the DA will be quarterly.

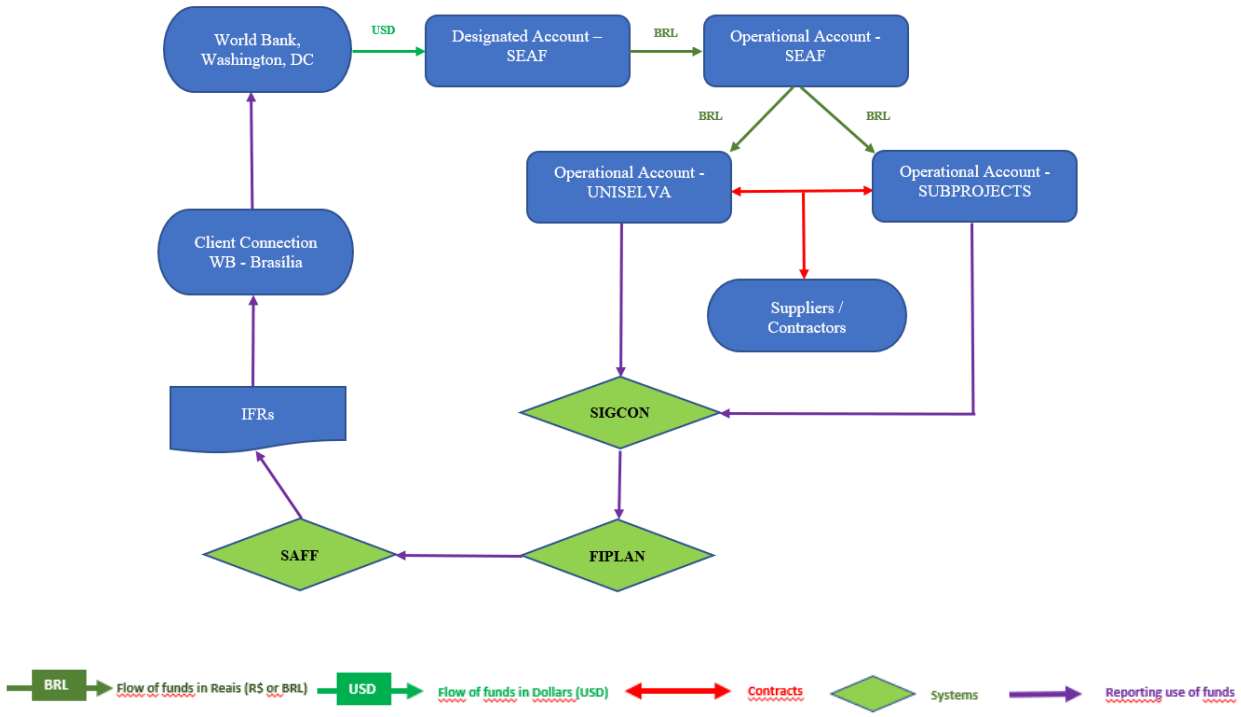
46. Figure 2 shows the main flows of funds for the project.

    (i) Funds advanced to Uniselva and subprojects/matching grants will be documented to the Bank, via Customized SOEs, based on actual expenditures as showed in charts ii) and iii) below.

    (ii) In the case of Uniselva: funds will be advanced from the SEAF's Operational Account to the separate segregated operational account opened by Uniselva in BRL to cover their project expenses for a three-month period. Uniselva will submit a monthly reconciliation implementation report to the PMU. Every quarter a new advance will be provided to Uniselva based on the reconciliation and forecast reports.

[75] To be opened within one month after loan effectiveness. This is not a condition of effectiveness.

Figure 2: Main flows of funds for the project

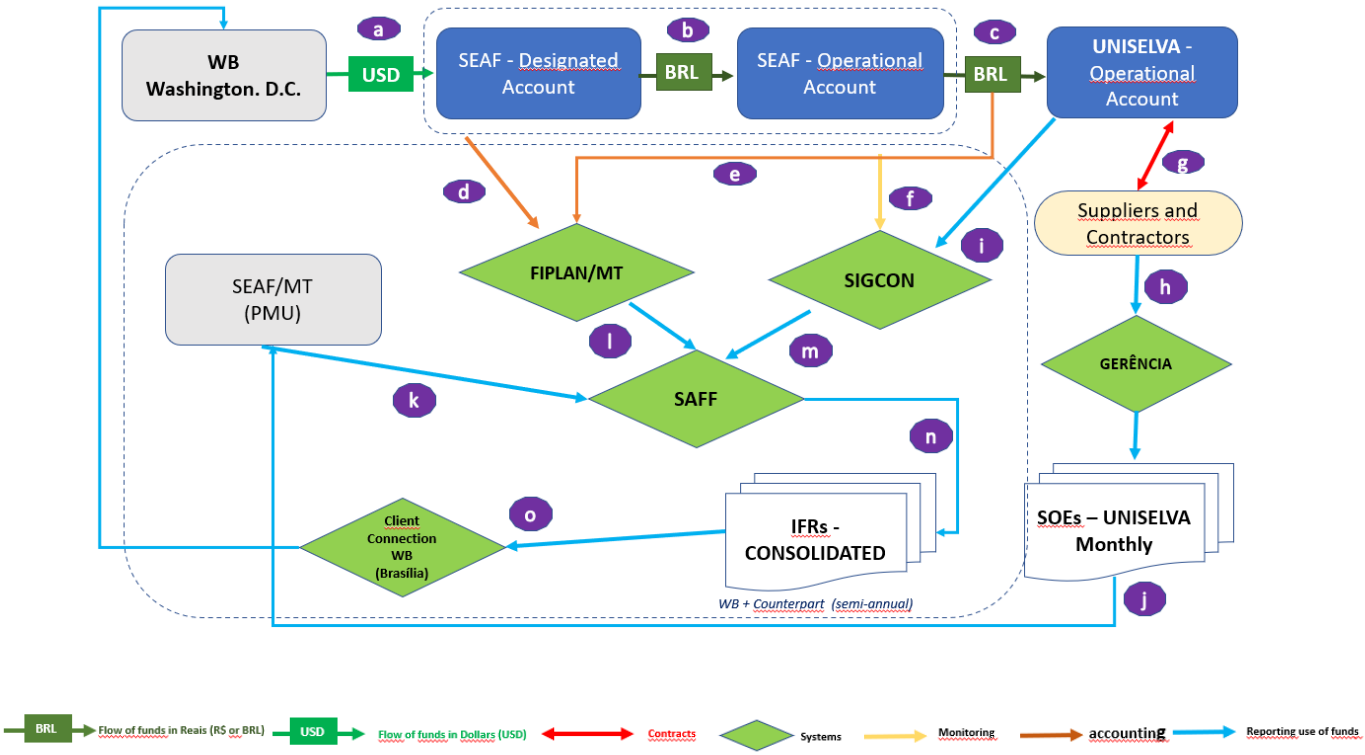


(iii) The SIGCON ("Sistema de Gestão de Convênios e Parcerias") will be utilized by the subprojects' beneficiaries/matching grants and Uniselva to monitor the physical and financial implementation. The system has been reviewed and considered satisfactory.

(iv) Advances to the subprojects/matching grants: (i) SEAF allocates funds to be executed based on subproject budget estimates and the approved Business Plan; (ii) a subsidiary financial agreement ("Convênio de Financiamento") would be signed between the subproject executor and SEAF, to receive funds in a bank account opened for the subproject and setting out other payment clauses; (iii) SEAF reviews, monitors and approves the requests for payments to the subproject executors (upon provision of the full documentation of any previous advances/payments made to the subproject executor); (iv) new advances to the subproject executors are made.

47. Figure 3 shows the flow of funds from SEAF's Designated Account to the Uniselva Operational account.

Figure 3: Flow of funds from SEAF to Uniselva



(a) World Bank funds, in USD, are transferred to SEAF's exclusive Designated Account in USD.

(b) The funds in USD are internalized in the SEAF's Operational Account – R$.

(c) SEAF will advance only banks' funds by FIPLAN to a segregated Uniselva's operational account – R$, which will be open exclusively to receive WB funds.

(d) and (e) Inflows of funds from the Designated Account (R$ or USD) and transfers of funds to Uniselva carried out by SEAF's operational account are booked in the FIPLAN system.

(f) The resource referring to the transfer to Uniselva will be monitored via the SIGCON system.

(g) Uniselva will make payments for services provided and/or acquisition of goods.

(h) and (i) Monthly, based on the accounting/financial Gerência system, Uniselva will report to SEAF (through customized SOEs) and in the SIGCON system, the source and use of project's funds resources. Funds transferred will only be reported in the SOEs upon proof of expenditures.

(j) Uniselva will submit the SOEs to SEAF, and SEAF will consolidate it with the project's IFRs.

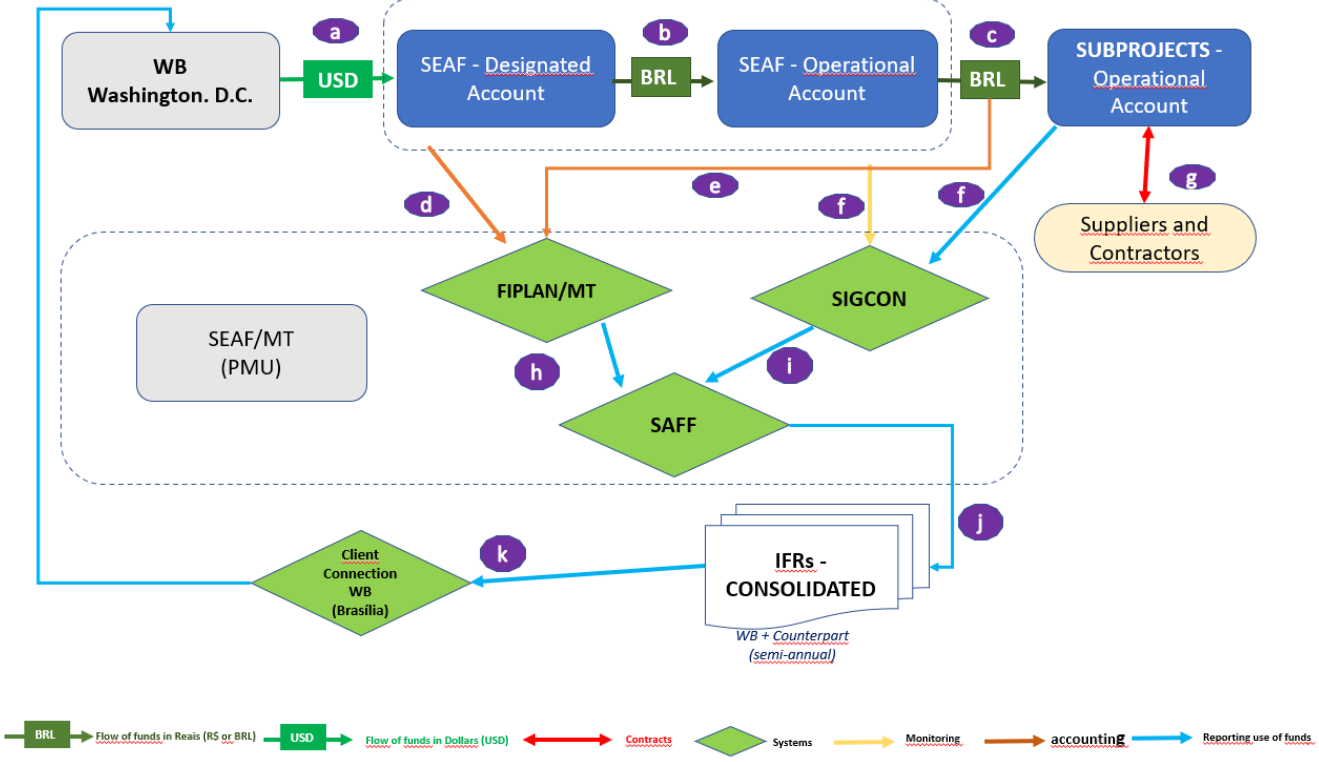
(k), (l), and (m) The SOEs received from Uniselva are transferred to the SAFF system, as well as transactions originating in the FIPLAN and SIGCON systems.

(n) Through SAFF, the project's financial statements – IFRs (cash basis, R$ and USD) are generated (including the World Bank Resources and Counterpart).

(o) Every six months, the project's IFRs reports are sent to the Bank, through the Client Connection system.

48. Figure 4 shows the flow of funds from the Designated account to subprojects/matching grants/producer organizations.

Figure 4: Flow of funds from the Designated account to subprojects/matching grants/producer organizations



(a) World Bank funds, in USD, are transferred to the project's exclusive Designated Account in USD.

(b) The funds in USD are internalized in the project's Operational Account – R$.

(c) SEAF will transfer resources from the project's exclusive Operating Account – R$ - to each of the respective bank accounts of the subprojects/matching grants. The bank accounts for the Subprojects are exclusive to the project.

(d) and (e) The entries of resources from the Designated Account (R$ or USD) and transfers of resources to the operational accounts of the subprojects are booked in the FIPLAN system.

(f) The transfer of funds and accountability of the subprojects to SEAF will be monitored via the SIGCON system.

(g) The subprojects will use the transfer of funds to make payments for services rendered and/or acquisition of goods.

(h) and (i) Periodically, all transactions related to the project in the FIPLAN system are transferred to the SAFF system.

(j) Through the SAFF system, the project's financial statements – IFRS (cash basis, R$ USD) are generated (including World Bank resources and Counterpart) – including the contribution % or "in-kind" of the subprojects/Production Organizations.[76]

(k) Every six months, the project's IFRs reports are forwarded to the Bank, through the Connection system.

49. SEAF agreed with the Bank on the activities that will be considered counterpart funds. The counterpart funds shall be earmarked in detail in their sources to link to the project's activities. The source of the counterpart resource should be in detail according to the object, seeking evidence, and strengthening the control of project execution, requiring the opening of the process, providing information, and requesting that SEAF's team proceed with the respective transfer with a source already detailed. The counterpart funds will be managed separately from the Designated Account. Counterpart funds will be properly accounted for, monitored, and reported by SEAF through the IFRs reports – by category, component, and sub-component.

Table 1: Category of Expenditures and Financing Percentages (in US$):

Category	Amount of the Loan Allocated (USD million)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consulting services, Operating Costs and Training for Parts 1.1 and 3 of the project	11.0	100%
(2) Matching Grants under Part 1.2 of the project	56.0	100%
(3) Goods, works, non-consulting services, consulting services, Operating Costs and Training for Part 2 of the project	13.0	100%
(4) Emergency Expenditures	0	100%
[(5) Front-end Fee	0	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(6) Interest Rate Cap or Interest Rate Collar premium[77]		Amount due pursuant to Section 4.05 (c) of the General Conditions]
TOTAL AMOUNT	80,000,000	

50. A **Contingent Emergency Response Component (CERC)** with no funds is included in the project as a mechanism for funding requests arising from emergencies such as natural disasters and other shocks, as defined in the operational manual for the CERC. If such a crisis develops, the State can ask the World Bank to reallocate part or all the undisbursed loan proceeds to cover the costs of emergency response and recovery. During project preparation, the definition of the key aspects of the CERC will be detailed in the POM. The same flow of funds, accounting, financial reporting, disbursement methods and corresponding supporting documentation requirements, will apply to disbursements

[76] See Annex 2 – Beneficiary Contribution

[77] Include bracketed withdrawal category ONLY if the Borrower has elected caps and collars **AND** requested to finance the premia out of the proceeds of the loan. The amount allocated to this category will be zero until premia is to be charged.

under the CERC, that will be described in the initial DFIL, as the CERC will also be implemented by the same implementing agencies.

51. **Financial Reporting and Monitoring**. The FIPLAN system will adequately control, account for, report on, and manage the proposed project. The system will provide the necessary data to prepare the respective reports (using the SAFF System), in local currency (BRL), for statutory reasons, and US Dollars (USD), for Bank's disbursements and monitoring purposes on a cash-basis (although the State also follows accrual accounting). As a result, the PMU will ensure the timely production of semiannual Interim Financial Reports (IFRs) for further submission to the Bank, within 60 days after the end of each semester. The IFRs will be generated from the SAFF system. SEAF should submit for Bank's validation the IFRs (the automated format and content) no later than three months upon loan effectiveness.

52. Accordingly, the format and content of the IFRs will cover the following items:

- IFR 1 - Sources and Uses of Funds by disbursement category, with evidence of the World Bank's share in the financing of expenditures, cumulative (project-to-date, year-to-date, and for the period) versus actual expenditures, including a variance analysis
- IFR 2 - Uses of Funds by Project Activity or Component and Subcomponent, cumulative (project-to-date, year-to-date, and for the period) versus actual expenditures, including a variance analysis
- IFR 3 - Designated Account bank reconciliation and Bank statements
- IFR 4 – Monitoring of the Subprojects
- IFR 5 – Disbursement Forecast
- IFR 6 – Procurement/Contracts

53. **External Auditing**. For project's purposes, the annual financial statements will be audited by independent auditors[78], according to the TOR (which will also include "Fundação Uniselva") acceptable to the World Bank (prepared by the PMU and approved by the Bank, not later than one month after loan effectiveness and following the International Standards on 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 be prepared following the accounting standards acceptable to the Bank (i.e., IPSAS or national accounting standards where, as determined by the Bank, they do not significantly depart from international standards). The auditors should be hired within three months after loan effectiveness.

54. According to the World Bank's guidelines, the auditors will also have to prepare a Management Letter, where any internal control weaknesses will be identified, contributing to strengthening the control environment. The auditor's report will be submitted to the World Bank no later than six months after the closing of the fiscal year, and the annual

[78] The TCE-MT (Tribunal de Contas do Mato Grosso) was contacted to see if they were available to audit the Bank's projects. SEAF-MT has not been audited by TCE-MT since 2014 due to TCE's workload and the small budget amount within the state of Mato Grosso. The State Audit Court (TCE) is responsible for the State's external scrutiny, and the legislature plays an external oversight role. The State has been able to prepare timely financial statements of reasonable quality, however, SEAF-MT has not been audited by TCE-MT since 2014 due to TCE's workload and lack of budget.

audit may be financed out of the loan proceeds.

55. All audited financial statements and related audit opinions are disclosed by the project and by the Bank following the Bank's Policy on Access to information.

56. **The General Conditions require the Borrower to retain all records (contracts, orders, invoices, bills, receipts, and other documents) evidencing eligible expenditures and to enable the World Bank's representative to examine such records**. They also require the records to be retained for at least one year following receipt by the World Bank of the final audited financial statement required in accordance with the Legal Agreement or two years after the closing date, whichever is later. The Borrower is responsible for ensuring that document retention beyond the period required by the Legal Agreement complies with its government's regulations.

57. **Conditions or Nonstandard/Significant Financial Covenants (i.e., Relevant issues to be included in the Legal Documents)**. There are no FM-related conditions for Board and/or Effectiveness.

ANNEX 2: Geographic and beneficiary targeting approach

1. The project's geographic and beneficiary targeting approach resulted in the identification of 61 municipalities as eligible for project support for business plans under component 1. Under component 2, 35 State Settlements will be eligible for project support to improve land and environmental management. Given the interlinked nature of the activities proposed under components 1 and 2, the eligible municipalities are intended to overlap with the eligible Settlements such that beneficiaries may benefit under both components; critically, this will allow beneficiaries of component 1 to include aspects of land and environmental regularization in their business plans. The project's monitoring and evaluation approach will ensure against double counting of beneficiaries in these cases. As a result of this targeting approach and as described below, the project will directly benefit an estimated **15,000** family farmers and their respective POs participating under project components 1 and 2. These 15,000 direct beneficiaries include an estimated 9,000 family farmers operating in eight prioritized value chains (milk, fruits, horticulture, cassava, coffee, cacao, honey, and non-timber forest products) under component 1 and an estimated 12,900 family farmers residing in the selected State Settlements under component 2; an estimated 6,900 beneficiaries are expected to participate under both components. Indirect beneficiaries include all family farmers (81,635 according to IBGE, 2017) and PIQCTs in Mato Grosso, who will benefit from the improved technical assistance and land regularization services supported by the project under component 2.

2. **Component 1**. Mato Grosso is divided into 141 municipalities, 61 of which were selected as eligible for project support under component 1. The component 1 targeting approach consisted in a two-step process. In the first step, a mapping exercise was conducted to score municipalities according to three indicators: (i) gross value of family farming production for eight priority value chains considered significant for family farming (milk, fruits, horticulture, cassava, coffee, cacao, honey, and non-timber forest products; see Table 1),[79] (ii) number of family farms, and (iii) estimated deficit in permanent preservation areas ("deficit de APP").[80] The socio-economic indicators (i) and (ii) serve to ensure sufficient opportunity for project interventions to support family farmers residing in the eligible municipalities. While all value chains will be eligible for project support, a select number (eight) were prioritized due to their significance for family farmers and potential for generating benefits under the project for both family farming livelihoods and the environment.[81] The environmental indicator (iii) serves to ensure that the project targets those municipalities with significant potential for improvement in the management of permanent preservation areas under the Brazilian Forest Code. Using a statistical approach, the indicator scores of each municipality were standardized, compared to the average indicator values across all municipalities, and ranked.[82]

[79] While all value chains will be eligible for project support (including non-agricultural activities such as artisanal craftwork and agro-eco-tourism, which are common in PIQCT communities), these eight were prioritized as part of the targeting approach due to their significance for family farmers and potential for generating benefits under the project for both family farming livelihoods and the environment. See Annex 2 for more detail.

[80] Permanent preservation areas under the Brazilian Forest Code are natural protected areas that farmers are required to delimit and maintain according to certain management standards.

[81] For example, family farmers account for approximately 90 percent of milk (dairy cattle) production in the State and generate significant production value, making this value chain a critical entry point for reaching family farmers through the project. Non-timber forest products generate less in production value, but constitute a key source of income for family farmers identifying as PIQCT and are associated with environmental benefits such as forest conservation and carbon sequestration. In contrast, beef (cattle) was not prioritized due to the potentially significant, adverse environmental benefits associated with beef production (deforestation, other land use change, and high GHG emission intensities associated with beef systems).

[82] For each municipality, Z-scores were calculated for the three indicators as follows: Z-score = (value for the municipality – average value of the State) / standard deviation. Z-scores > 0 indicate scores above the average.

3. In the second step, a survey was conducted to determine the number of family farming POs (associations and cooperatives) actively engaged in the priority value chains and the size of their membership. This exercise serves to ensure a minimum applicant pool for the call for business plan proposals. Those municipalities both scoring above a certain threshold against the socioeconomic and environmental indicators and with at least one PO actively engaged in the priority value chains and with at least 60 members were selected. This resulted in 61 municipalities identified as eligible for project support (see map in Annex 3).

Table 1: Key characteristics of prioritized value chains

Value chain	Key characteristics	
1. Milk	• 90 percent of production in Mato Grosso is from family farmers (more than 30 thousand family farmers in Mato Grosso with dairy cattle). • Low productivity and insufficient rural credit.	• Very low use of integrated technologies. • Systemic use of poor practices e.g., for hygiene during milking, degraded pastures, and feed supplementation.
2. Fruits	• Low productivity and insufficient rural credit. • Very low use of integrated technologies. • Low organization among producers.	• High demand for family labor. • High demand for products from other Brazilian States.
3. Horticulture	• Low productivity and insufficient rural credit. • Very low use of integrated technologies. • High demand for rural extension.	• High demand for products from other Brazilian States. • High net return per hectare.
4. Cassava	• Low availability of productive materials. • Low technological level in crop management. • Artisanal processing without sanitary compliance and registration.	• 90 percent of production in Mato Grosso is from family farmers. • Staple providing food security for families.
5. Coffee 6. Cacao	• Low productivity. • Low availability of quality seedlings. • Low availability of labor at harvest.	• High demand for products. • High demand for family labor.
7. Honey	• Low productivity due to insufficient native flowering and damage from pesticides. • Lack of extraction, processing, certification and technology infrastructure.	• High market demand for products. • Low investment and high net return. • High potential for environmental benefits (forest conservation).
8. Non-timber forest products	• Low availability of forest seeds for recovery of degraded areas. • Drastic reduction of rustic and productive traditional seeds.	• Key source of income for family farmers identifying as PIQCT. • High potential for environmental benefits (forest conservation, carbon storage).

4. Within the municipalities eligible under component 1, the project aims to directly support an estimated **9,000** family farming and PIQCT households through the preparation and implementation of an estimated 128 business plans. Business plans will be prepared and implemented by POs (associations and cooperatives) and their members. The business plans will contribute to socioeconomic inclusion in two main ways. First, a minimum of 15 percent of subprojects will be led by youth, a minimum of 15 percent will be led by women, and a minimum of 15 percent will be led by PIQCTs. Moreover, targets will be set across windows for the overall participation in business plan activities by these vulnerable groups (30 percent youth, 20 percent women, and 15 percent PIQCTs). Second, to enable inclusion of diverse economic groups, two grant windows will be available under component 1 to finance business plans, each with conditions tailored to the needs of POs with different levels of organization, commercialization, and experience:

   i. **"Commercial" family farming POs**: formal, well-structured, and experienced POs and family farmer members

with active and regular activity in formal markets;

ii. **"Emerging" family farming POs**: formal POs and family farmer members with technical potential to achieve a considerable surplus production, but with surplus production currently deficient due to low productivity, poor organization and management, or deficient production quality standards.

5. **It is intended that through this window differentiation, family farmers are supported to "graduate" over time** from emerging to commercial models of production and from commercial models utilizing project support to those that can thrive on their own (see **Figure 1**).

Figure 1: Beneficiary targeting and window differentiation under Component 1

6. The 9,000 estimated beneficiaries of business plans under component 1 will also be eligible to receive support for land and environmental regularization under component 2 (see below).

7. **Component 2**. 35 State Settlements will be eligible for project support to improve land and environmental management under component 2. Within these Settlements, the project will aim to directly support an estimated **12,900** family farmers and PIQCTs with activities to support land and environmental regularization. Regarding land regularization, 35 Settlements (corresponding to **1,900** family farms residing in 6 municipalities) will be supported with geo-referencing and validation surveys toward completion of the State land titling process under INTERMAT. These 35 Settlements constitute the only State Settlements currently without support for land titling. Four of the 6 municipalities containing these Settlements are also eligible for project support under component 1, providing the

opportunity for business plans in those municipalities to support aspects of the land titling process.[83] Regarding environmental regularization, a target of **11,000** family farmers and PIQCTs will be supported to register in the CAR and develop CAR compliance plans. Those beneficiaries who respond to Expressions of Interest under the calls for proposals for component 1 will be prioritized for CAR support, in order to enable CAR registration and compliance to form part of the proposed business plans. Family farmers and PIQCTs residing in the State Settlements already with land titles, or in the process of land titling, will also be prioritized. Beneficiary targeting under component 2 will also contribute to inclusion of women through targeting a minimum portion (15 percent) of land regularization titles to be issued in the name of women. Should the needs for CAR registration within the Settlements be less than anticipated, private land holders outside the Settlements will become eligible for support under this activity to enable reaching the target of 11,000.

8. Indirect beneficiaries of the project include: (i) private agribusiness enterprises and government entities who may enter into partnerships with producers under component 1, and (ii) all family farmers (81,635 according to IBGE, 2017) and PIQCTs in Mato Grosso, who will benefit from project activities to improve extension services and increase the efficiency of environmental and land regularization services in Mato Grosso as a whole.

[83] Of the 6 municipalities contained in the 35 State Settlements targeted for land regularization, Cuiabá, Nossa Senhora do Livramento, Poconé, and Santo Antônio de Leverger are eligible for support under component 1 while Barra do Bugres and Poxoréu are not.

ANNEX 3: Gender Action Plan

1. **Objective.** The project's Gender Action Plan aims to reduce income gender gaps among family farmers in Mato Grosso, by providing access to agricultural extension, technical information, and subsidized funding for productive activities to women and their Producer Organizations following a Productive Alliance approach in selected productive chains.

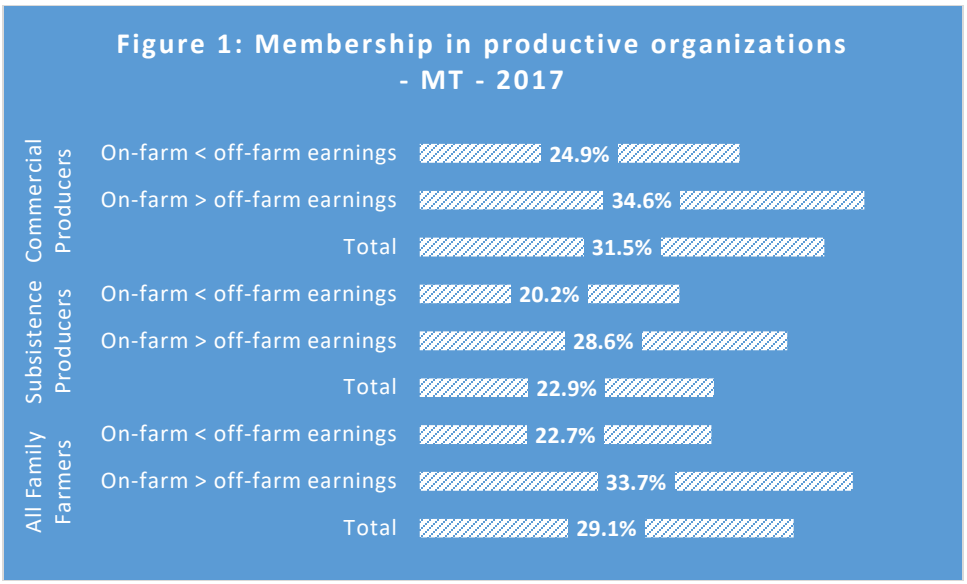
2. **Gender Gap Analysis**

Context: Family Farms in Mato Grosso

3. The last official data available (IBGE's Agrarian Census of 2017) shows that there were 81,635 family farms in in Mato Grosso, counting for 68.8% of the landholdings and holding just 9.3% of the land area. The average size of these family farms equaled 62.85 hectares. Most of the family farmers were male (71.7%). One fourth of the family farms were run by the elderly (65 and more years old) and just 9% by people under 35 years of age. Twelve percent of them were illiterate and just 5% have achieved an under-graduate degree. Most of the family farmers were Afro-Brazilians (53%), followed by whites (45%). Indigenous peoples counted for 1% of the family farmers in Mato Grosso.

4. Among family farmers, the main economic activity was ranching and cattle breeding (82% of the farms and 87% of the land area), followed by temporary crops (11% of the farms and just 8% of the land area). According to the main purpose of agricultural production, most of the family farms in Mato Grosso produce for markets (71.8%), but 28.2% continued to produce mostly for family consumption and emerging. In this year, 79.8% of the family farmers in Mato Grosso had on-farm earnings and 48.5% had off-farm earnings (pensions, conditional cash transfer programs, off-farm jobs, etc.). The average annual on-farm earnings reached more than 43.3 thousand Brazilian Reais, whereas the average annual off-farm earnings were just above 8.7 thousand Brazilian Reais. On-farm earnings were higher than the off-farm earnings among 58.4% of them. This rate reached 68.7% among the market producers and dropped to 28.2% among the emerging producers.

5. Only 29.1% of Mato Grosso's family farmers belonged to producers' organizations (associations and/or cooperatives). There was a huge gap between family farmers producing for self-consumption (emerging) and for the market in terms of membership to these producers' organizations. On the one hand, 31.5% of the family farmers who produce for the market belonged to producers' organizations and counted for 77.8% of the total members of producers' organizations. On the other hand, only 22.9% of those who produce for emerging did so and counted for just 22.2% of the total members of these organizations. Furthermore, among the members of producers' organizations 67.6% had on-farm earnings that were higher than off-farm earnings (13.2% recruited among emerging producers and 86.8% among market producers). Figure 1 (below) breaks down the data one step further and suggests that there was a positive correlation between participation in productive organizations, production for market, and farmers' greater dependency on the on-farm earnings.



6. Only 12.5% of the family farms had access to agricultural extension – the provision of information, training, and advice in agricultural production – and 4.5% had access to governmental agricultural extension. These figures were much higher among the members of producers' organizations: 21.1% of them had access to agricultural extension and 7.6% to governmental agricultural extension. Most of the family farms (83.7%) got access to technical information through different channels: 61% through TV broadcasting networks, 38% through radio broadcasting networks; 13% through websites, only 10% through technical meetings and seminars, 6% through newspapers and 5% through magazines.

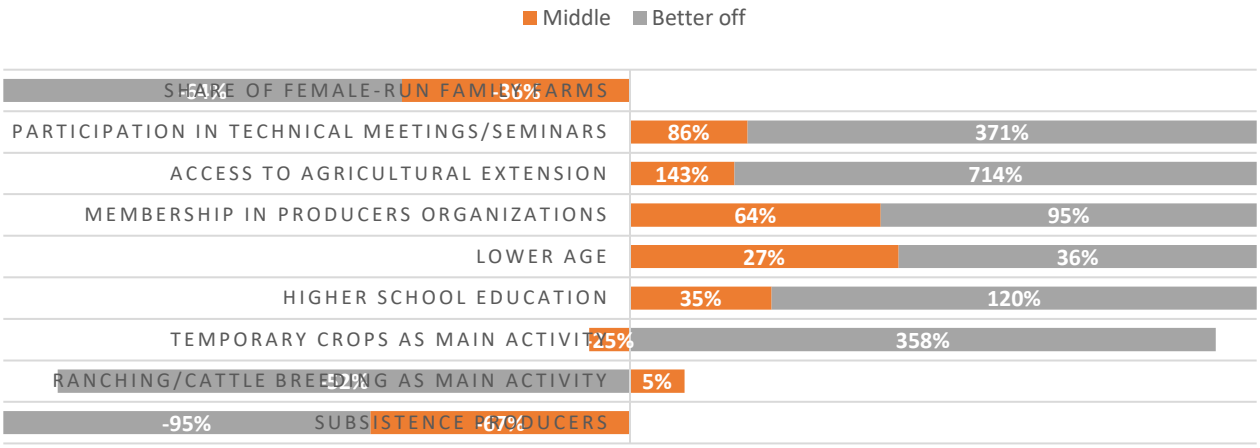
7. The Agrarian Census 2017 classifies the family farms in three different groups based on the eligibility criteria of the National Program for Family Farming Strengthening (PRONAF):[84] a) those who were eligible for PRONAF

[84] The credit lines of PRONAF are open to farmers. artisanal fishermen (dedicated to artisanal fishing, for commercial purposes, exploring the activity as autonomous, with their own means of production or in partnership with other equally artisanal fishermen), aquiculture producers (dedicated to the cultivation of organisms that have their normal or most frequent means of life in water and exploit an area not exceeding 2 hectares of water or, when the exploitation is carried out in a net-tank, occupy up to 500 m^3 of water, silviculturists (who cultivate native or exotic forests and who promote the sustainable management of those environments), extractive producers (who carry out artisanal extractives in rural areas, excluding scrap gold miners and sparklers, and members of rural *Quilombola* communities or indigenous peoples or members of other traditional peoples and communities, who: i) explore a plot of land as owner, squatter, tenant, borrower, partner or concessionaire of the National Agrarian Reform Program, or permission holder of public areas; ii) reside on the property or nearby; iii) do not have, for any reason, an area greater than four fiscal modules, contiguous or not, quantified according to the legislation in force (this item does not apply in the case of rural condominiums or other collective forms of property, provided that the ideal fraction per owner does not exceed the four fiscal modules); iv) obtain at least 50% of the family's gross income from the farm and non-agricultural exploitation of the establishment; v) have family work as predominant in the operation of the establishment, only eventually using salaried work, in accordance with the seasonal requirements of the agricultural activity, being able to keep permanent employees in a smaller number or equal to the number of people in the family employed with the family enterprise - except in the PRONAF Microcredit Line (Group "B"), which does not admit the maintenance of any salaried employee on a permanent basis; and vi) have obtained annual gross family income of up to BR R$500,000 in the last 12 months of normal production prior to the request of the PRONAF Aptitude Declaration (DAP), considering in this limit the sum of the entire Gross Value of Production (GVP), 100% of the amount of on farm earnings and other income from activities carried out on the establishment and outside it, received by any family component (except social benefits and social security income arising from rural activities).

B's credit line as they meet the eligibility criteria and had average annual earnings up to 23 thousand Brazilian reais; b) those who were eligible for PRONAF V's credit line as they meet the eligibility criteria had annual earnings above 23 and up to BR R$500,000 ; and c) those who did not meet the eligibility criteria for PRONAF. The first group comprised 51% of the family farmers in Mato Grosso (and held 35% of the land area under family farming), the second group comprised 48% of them (and held 60% of this area) and the last group just 2% of them (and held 5% of the area). The total annual average earnings of the first group equaled 19% of the second group and just 2% of the third one. In consequence, for easiness of reference, these groups will be thereafter called: the worse-off, the middle, and the better-off family farmers.

8. There are many other relevant and explanatory distinctions between these groups besides their annual revenues. The average size of the farms of the worse off was less than ¼ of the better off farms and equaled 54% of the middle group farms. While the average off-farm earnings of the worse off were higher than the on-farm earnings, the off-farm earnings of the middle group were just 15% of the on-farm earnings and this ratio equaled 2% among the better off. Furthermore, and as depicted in Graph 2 (below), the share of emerging producers among the worse off was much larger than among the other two groups. While ranching/cattle breeding was the main economic activity among the worse-off and the middle groups, the better-off were more involved with temporary crops. The members of the worse-off group tended to be older and have achieved lower levels of school education. Membership to producers' organizations, access to agricultural extension and reliance on technical meetings and seminars as a source of technical information also increased with the income scale.[85] **However, critically, the share of female-run family farms sharply declined as income increased.**

Figure 2: Selected comparators taking the worse-off group as reference - MT - 2017



Gender Gaps in Mato Grosso's Family Farms

9. Women run 18.3% of the family farms in Mato Grosso. Female-run family farms and farms run by a couple

[85] It is worth noticing that within each of these income groups, membership in producer organizations increased access to agricultural extension. Thus, the overall rate of access to agricultural extension equaled 2.9%, 8.8% and 17.8% among the worse-off, the middle group and the better-off, respectively; whereas this rate reached 13.1%, 24.5% and 64.4% among the members of these groups who were also members of producer organizations.

count for around 40% of the family farms in Mato Grosso.[86] The average size of their farms equaled 46.41 hectares (in average 30.3% less than male-run's family farms) and, in total, only 13.5% of the family farms' lands were under women's control. Management of family farms can be taken as a proxy for control over land assets and family decision-making on agricultural production. The distribution of male- and female-run's family farms by land tenure status showed that most of them were under full land ownership (85% and 82%, respectively); 10% of the male- and 15% of the female-run's family farms are comprised by establishments in land reform settlements; twice as much male- than female-run's family farms were in rented lands (6% and 3%, respectively); and 2% of both male- and female-run's family farms occupy encroached lands. It is worth noting that under any land tenure situation, female-run's family farmers were smaller than male-run's ones (as shown in Graph 3, below). The gap in average size was smaller among land reform settlers (20%), raised to 29% among landowners and 33% among renters, and peaked among encroachers (63%).

Figure 3: Average family farm`s size (hectares) by land tenure status and gender - MT - 2017

10. Women running family farms tended to be younger and to have achieved higher levels of school education than men's family farmers. They had less access to agricultural extension than men. The share of men and women having access to technical information was quite the same (83.5% among the women and 83.7% among men), and, overall, they got information through the same channels (prevailing the TV and radio broadcasting networks and have a slight difference in the share that got it through technical meetings and seminars – 11% among men and 9% among women). Overall, there is also a very slender difference in terms of membership to producers' organizations: only 29.1% of the family farmers are enrolled in producers' organizations and this rate equals 29.5% among men and 27.5% among women.

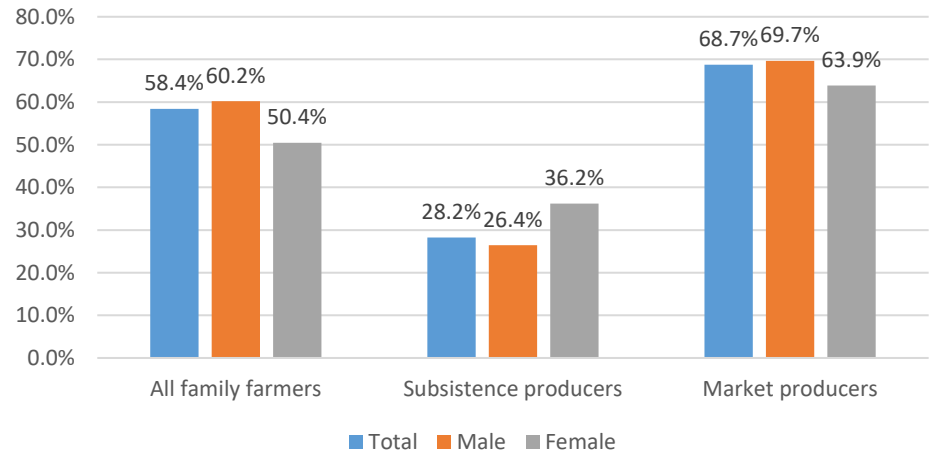
11. Their on-farm productive activities are quite the same as men's: ranching/cattle breeding was their main activity (80.1% of the male-run's family farms and 79.8% the female ones are involved on it), followed by temporary crops (13.7% and 13.6% of them, respectively).87 However, the main purpose of the agricultural production was a major point of distinction between female and male family farmers from Mato Grosso: a

[86] In the state, 22.0% of the family farms were informed to be run by the married couple. Out of the female-run family farms, 22.4% were indeed run by the married couple and this rate equaled 21.9% among the male-run family farms.

[87] Exceptionally, the very small number of female-run's family farms among the better-off income group relies mostly in temporary crops. While 54% of the male-run's family farms in this group sow temporary crops as their main economic activity, 69% of the better-off female family farmers do it.

larger share of those run by women than those run by men still remained mostly emerging producers (36.2% of the females' vis-à-vis 26.4% of the males'). The weight of on-farm earnings on family budget was also largely disparate among female and male family farmers: on-farm earnings were higher than off-farm earnings among 50.4% of the female-run's family farms and climbed to 60.2% among the male-run's ones. It was directly associated with the predominance of production for emerging or for the market as shown in Graph 4, below.

Figure 4: Family Farmers with on-farm earnings higher than off-farm earnings by gender and main purpose of production - MT - 2017

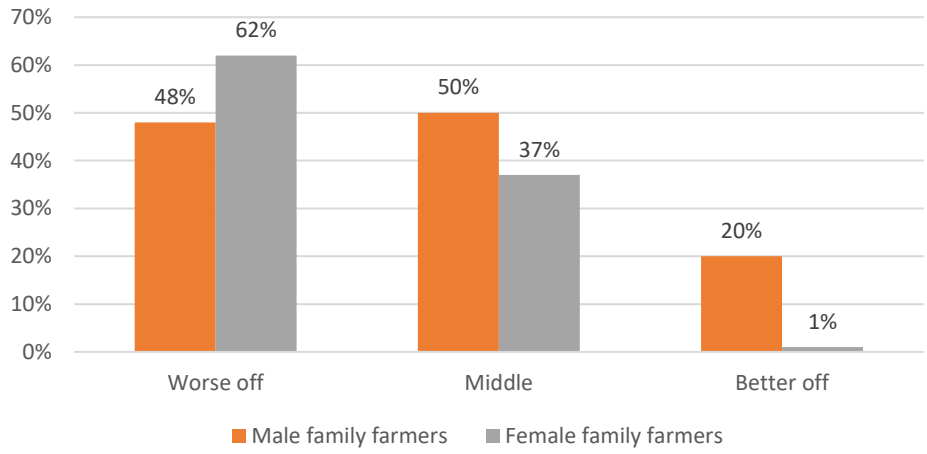


12. However, these average gender gaps and similarities do not provide an accurate picture. Breaking down the data available and considering the different income groups in which family farmers can be classified, it is found that:

- Female family farmers from all income groups have achieved higher levels of school education than males.
- The average size of female-run's family farms was smaller than male-run's family farms, but this gap decreased with income, as it peaked at -25% among the worse-off and decreased to -22% among the middle group and just -13% among the better-off.
- Regarding land tenure, a small share of male family farmers were owners among the worse-off and middle groups, whereas a higher share of female family farmers was found among the land reform settlers in all three income groups (gaps equal to +4% among the worse-off, +5% among the middle group and +8% among the better-off). Among the better-off, the share of male family farmers using rented lands more than double the share of female family farmers).
- With regards to the main economic activity, there was relevant gender gap on the share of family farmers sowing temporary crops that grows with income: in all income groups more female family farmers than men's family farmers sowed temporary crops, but this gap rose from +2% among the worse-off, up to +5% among the middle group, and up to +15% among the better-off.
- Emerging production was more frequent in female-run's family farms than male-run's - apart from the better-off, among which no female-run's family farm produced for subsistence. The gap reached +16% among the worse-off and +32% among the middle group.
- A smaller share of female family farmers than male's family farmers had on-farm earnings higher than off-farm incomes among the worse-off and middle-groups (a gap of -6% in both groups). This trend was reversed among the better off (a gap of +4%).

- Within each income group, there was no gap in terms of access to agricultural extension and membership to Producer Organizations (as seen these gaps were huge between the income groups).
- There were no relevant gender gaps among the worse-off and the middle group regarding technical information access. However, there was a relevant gender gap (-6%) among the better-off. Above all and as shown in Graph 5 (below), female-run's family farms were overrepresented among the worse-off.[88] Consequently, a huge gender gap on income was a hallmark of family farming in Mato Grosso.

Figure 5: Share of Male- and Female-run's's Family Farms by Income Group - MT - 2017



13. In short: Female family farmers were overrepresented among i) the worse-off farmers, ii) the emerging producers and iii) the family farmers whose on-farm earnings are smaller than off-farm earnings. Female family farmers also held smaller farms and had less access to agricultural extension and opportunities to participate in technical meetings and seminars. Female family farmers from the most economically vulnerable group faced even worse conditions of access to productive means, rural extension, technical knowledge, productive associations, and the market. And their condition is even worse than that of male family farmers in the same economic group.

Gender Sensitive Project Activities

14. The objective of the project is to improve the access to markets, climate resilience, and land and environmental management of selected family farmers in Mato Grosso and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it. Improved access to markets will be pursued by adopting a Productive Alliance approach and can contribute to social inclusion and reduce the prevailing gender gaps among family farmers.

15. The project aims to: (i) increase women's access to productive assets and inputs: improving women's access to inputs and extension services and access to technology to increase productivity; (ii) provide training, to improve technical and business management skills and to equip women to take advantage of profitable economic opportunities; (iii) improve access to technical information and marketing networks for women: stimulating the demand for women's products by improving their access to markets and linking women farmers with

[88] Family farms run by married couples, counted for 19.3% of the worse-off farmers, 25.1% of the middle-income farmers and 14.8% of the better-off.

market intelligence services; and (iv) improve women's participation in cooperatives and representative organizations.

16. The project's support for women will be mainstreamed in the key value chains in which they are involved and the project will address the gaps that exist in women's access to training, inputs, capital, and markets compared to their male counterparts. Furthermore, the project will incorporate beneficiary targeting criteria that explicitly include gender equality aims. Hence:

    a) In the foreseen land regularization activities in 35 land reform settlements created by Mato Grosso and managed by INTERMAT, all land titles will be issued in the name of the women of the family and/or of the married couple.
    b) In the foreseen activities supporting the preparation and implementation of Business Plans of Producer Organizations:

        i. Fifteen percent of the funds will be provided in support of women Producer Organizations to increase women's incomes by growing and marketing high-value cash crops.[89]
        ii. In the selection of the remaining business plans,[90] additional scores for prioritizing will be applied in advantage of the proposals from Producer Organizations in which women producers comprise at least 40% of the beneficiary members.[91]

17. In providing support to Women's Producer Organizations – and particularly the organizations that are mostly composed by the worse-off family farmers – the project will take into consideration the barriers that prevent many female family farmers from producing cash crops rather than food crops. Thus, the project has distinguished the eligibility criteria for its two windows and may consider – as an adaptative management measure – a reduction in the counterpart contribution required for female Producer Organizations or a higher matching grant for business plans involving Producers Organizations with a minimum number of formal members who are women.

18. Furthermore, the technical assistance elements embedded in the approach for Component 1 will be based on a strong analysis of gender issues to identify obstacles to women's participation and a set of specific actions to address them (as already incorporated in the project's Stakeholder Engagement Plan). Thus:

    a) Measures related with a Gender Equitable Agricultural Extension:

        i. Project agricultural extension workers (staff from EMPAER and consultants) – particularly those supporting the preparation of both the Expressions of Interest and the Business Plans by Producer Organizations – will be fully trained in gender-sensitive extension approaches, to be able to:

            - assess gender-related issues;
            - identify women's "invisible" economic contribution to family farms;

[89] It is worth noticing that two other equal shares of 15% of the funds are reserved for a) Indigenous Peoples, *Quilombolas* and Traditional Communities and b) youth Producer Organizations.
[90] Eligible for 55% of the funds of the component.
[91] This ratio is considered as it has been adopted since 2011 by the National Food Acquisition Program (PAA), created by Law 10,696/2003. Since them the share of women producers among PAA beneficiaries has increased from 27% up to 74% in 2022.

- identify the barriers that may exclude them from and/or hamper their full participation in Producers Organizations, in the market, and in Productive Alliances; and,
- help determine feasible ways in which the project can contribute to ease those barriers.

ii. Agricultural extension teams will encourage women's participation on exposure visits as well as women to host on-farm demonstrations and field days.

iii. The recruitment of agricultural extension workers to perform works related to the project – particularly supporting the preparation and implementation of Business Plans – will be committed with providing field teams composed by both women and men, looking to ensure the best possible gender balance in the composition of the project's labor force. Thus, gender-sensitive language will be used to describe consultant positions in the ToRs and gender targeting concerns will be reflected in the tendering process and in all contracts with service providers and consultants.

iv. Gender-equitable staffing has also been proposed for the Project Management Unit.

v. Measures related to Beneficiary Selection. The project staff in charge of evaluating Expressions of Interest and Business Plans will also be fully trained, aware and capable of addressing gender issues.

b) Measures related with Communication and Information:

i. All communication and information activities will consider and use the different media that are preferred by both women and men. According to the available information, language is not a relevant barrier, but literacy levels and access to the internet may be barriers for women of the worse-off group of family farmers.

ii. Communication and information materials will cover topics that necessarily meet women's needs and will disseminate good experiences held by Women Producer Organizations as well as Producer Organizations that promote women's full participation and empowerment.

iii. Agricultural extension workers will be oriented to distribute communication and information materials to as well as to engage on a routine basis with both women and men, adult and youth in each family farm engaged in the implementation of the Business Plans.

c) Measures related with Capacity Building:

i. All training and capacity building events will be designed taking in consideration the special needs and the contents that are relevant for women – including their heavy household workload, childcare responsibilities, travel, and time constraints to participate in technical meetings and seminars, concerns with production for family food consumption.

ii. All training and capacity building events – particularly those dealing with the development of cash crops/production for markets that are not traditionally in the domain of women, the development of women's skills in areas that are not traditionally considered to be in the women's domain and the development of leadership and negotiating skills – will foster the participation of women family farmers and ensure that the timing and venues are convenient for women.[92]

iii. The project will also promote awareness raising sessions – engaging women, men, girls, and boys - on adverse masculinity norms and the enhancement of women's voice and agency.

[92] The timing and types of project activities and training will be coordinated with women's time, resources and operational skills.

d) Measures related with monitoring and evaluation (M&E):

   i. M&E activities – particularly those involving beneficiary surveys – will ensure that both women and men will have the opportunity to express their views and share their concerns about the implementation of project activities and the findings of these activities will report gender disaggregated data.

Project Expected Outcomes for Reducing Relevant Gender Gaps

19. The combination of gender-sensitive activities incorporated in project design is expected to contribute to reducing the overrepresentation of female family farmers among the most vulnerable family farmers. This outcome will be measured in two main aspects that contribute to such overrepresentation of women among the worse-off group:

    a) The first refers to the identified gender gap among beneficiary family farmers producing for the market. Based on the information available, it can be estimated that the baseline gap is around 9 percentage points in detriment of women family farmers. The project goal is to halve this gap.
    b) The second refers to the identified gender gap among beneficiary family farmers whose on-farm earnings are higher than their off-farm earnings. Based on the information available, it can be estimated that the baseline gap is around 10 percentage points in detriment of women family farmers. The project goal is also to halve this gap.[93]

20. The gender equity theory of change for the project is presented in Figure 6.

[93] To ensure these outcomes are fully attributable to Project activities and a relevant test of the applied approach on reducing gender gaps, the Project will run a nonrandomly assigned control group study. With this purpose, the project will conduct baseline (during the first year of Project implementation) and endline surveys, including a control group.

Figure 6: Gender equity theory of change for the project

Gender Gap		Activities	Output Indicators	Outcomes	
Female family farmers were overrepresented among the worse-off family farmers	*Female family farmers held less and smaller family farms*	In the foreseen land regularization activities in 35 land reform settlements created by Mato Grosso and managed by INTERMAT, land titles will be preferentially issued in the name of the women of the family and/or of the married couple.	Percentage of land titles issued in the name of the women and/or married partners Baseline: zero Target: 85%	Increased land tenure security among female land reform settlers, opening their access to credit markets.	Reduced vulnerability of family farmers and reduced overrepresentation of female family farmers among the worse-off family farmers
	Female family farmers had less access to agricultural extension and opportunities to participate in technical meetings and seminars.	The project will support the implementation of Gender Equitable Agricultural Extension aiming to enhance women's visibility as a productive actor and their voice by: (i) employing women as agricultural extension workers; (ii) training agricultural extension workers to improve the delivery of services to women family farmers; (iii) designing all communication materials, training and capacity building events taking in consideration the special needs and the contents that are relevant for women; (iv) fostering the participation of female family farmers in all capacity building activities; (v) carrying out of training workshop on gender issues; and, (v) adopting a monitoring and evaluation approach that ensures women have the opportunity to express their views and share their concerns.	(i) Percentage of women hired to provide Agricultural extension in project supported activities Baseline: zero Target: 25% (ii) Share of women family farmers among the beneficiaries of agricultural extension activities Baseline: zero Target: 30% (iii) Share of women family farmers among the beneficiaries of training and capacity building activities Baseline: zero Target: 30% (iv) Share of women family farmers in the sample of the beneficiary assessment of project supported activities Baseline: zero Target: 50%	Increased access of female family farmers to or reduced gender gap in access to agricultural extension, training and capacity building opportunities. Increased recognition of women's contribution to family farm.	
	Female family farmers were overrepresented among the emerging producers and among family farmers whose on-farm earnings are smaller than off-farm earnings.	In the financing of Business Plans, adopt criteria for prioritizing: a) Women-led producers' organizations; and, b) Producers' organizations with a minimum number of female family farmers among their members	a) Share of women-led producers' organizations implementing Business Plans Baseline: zero Target: 15% b) Share of women members of non-women-led organizations benefiting from Business Plans Baseline: zero Target: 25%	Halving the gender gap in production for markets among project Beneficiaries Baseline: -9.0% Target: -4.5% Halving the gender gap on-farm earnings are greater than off-farm earnings. Beneficiaries Baseline: -10.0% Target: -5.0%	

ANNEX 4: Economic and financial analysis (EFA)

Introduction

1. **The project's Economic and Financial Analysis (EFA) undertakes an ex-ante analysis of the economic and financial cost-benefit of project interventions**. The analysis builds cash flows for "with" and "without" project scenarios, using realistic and conservative figures to estimate the following indicators: gross and net margins, return on labor, Net Present Value (NPV), Financial Internal Rate of Return (FIRR), and Benefit-cost ratio (B/C ratio). These indicators are estimated: (a) for the overall project; (b) specifically for the CSA Family Farming Business Plans under component 1; (c) by investment categories; and (d) by production models. Environmental benefits generated by the project are included as economic benefits. A sensitivity analysis is carried out to explore the likely impacts of possible changes in key variables such as benefits, costs, interest rates and years of evaluation.

2. The analysis of Component 1 estimated the net incremental benefits for farmers, rural entrepreneurs and communities, including vulnerable priority groups as a result of project intervention. Benefits accruing to farmers include i) larger production volumes available for sale, ii) increased value added of family farming products, iii) more stable income from family farming through increased production systems' resilience. In the long term, improved environmental compliance and land tenure should also contribute to the sustainability of farm incomes. Additional benefits for the society will be generated from improved or maintenance of ecosystem services in the areas in which the project will intervene, such as increased or maintenance of carbon storage and increased biodiversity.

3. The project will contribute to increased and more stable incomes of smallholder farmers through: (i) adoption of practices and technologies that enhance agricultural and livestock productivity; (ii) adoption of practices that contribute to improved resilience to climate change and extreme weather events; iii) enhanced processing efficiency, and iv) improved quality of products and access to markets that remunerate quality.

4. This change will be brought about by targeted technical assistance, investments in infrastructure and equipment, and changes in inputs and production factors use as designed in each PO business plan. The project will focus on the most promising value chains for family agriculture in Mato Grosso from a financial return and competitiveness standpoint. Interested producer groups, responding to market opportunities will ultimately determine the product mix of their business plans. The project is expected to support two types of producer organizations (PO): (i) "commercial", cooperatives, or associations with the aim to become cooperatives, that plan to sell as a group to formal private markets (wholesalers and retailers), (ii) "emerging", associations that aim at improving the individual production of their members and organize and improve their sales, but do not aim at selling as a group yet, or aim at selling to institutional markets.

5. **This annex presents the Economic and Financial Analysis (EFA) of the project's interventions based on twelve models that illustrate possible financial results from business plans financing**. For each illustrative example, the analysis accounts for project costs and benefits in a realistic and conservative manner and builds cash flows for scenarios "with" and "without" project, as well and for the difference between these scenarios (project result). Key-indicators of the analysis for each case are gross and net margins, value addition, Net Present Value (FNPV), Financial Internal Rate of Return (FIRR), and switching values for both benefits and costs.

6. The economic analysis of component 1 is based on a cash flow that considers the phasing in of the total estimated investment in producer organizations – direct (subprojects) and indirect (structuring of technical assistance services, management costs, etc.). The overall project cash flow was constructed for "with" and "without" project intervention scenarios, as well and for the difference between these two. The analysis is made considering economic prices and

accounts for estimated externalities in terms of carbon sequestration or avoided emissions estimated using Ex-act for the changes in land use described in each illustrative case. Key-indicators of the analysis are Project Net Present Value (NPV), and Project Economic Internal Rate of Return (EIRR).

7. Component 2 will invest in strengthening existing government capacity for family farms, land administration and environmental legal compliance. It will add to multiple exiting efforts and sources of finance and therefore its economic and financial analysis as a whole is not granted.

Financial Analysis

8. The primary objective of the financial analysis is to determine the incentives for the target group's participation in project activities. Hence, it examines the project´s estimated effects on family labor, net margins and cash flow. Pre-identified strategic products and their respective productive chains include a) milk and dairy products, b) fruit tree crops fresh and for pulp; c) fruit and vegetables, d) cassava; e) cocoa integrated in an agroforestry system, f) coffee, and g) beekeeping products. Illustrative models of primary production and processing, when relevant, were developed for each of these value chains.

9. The models were built with data from a mix of primary information (preliminary investment needs identified by a number of interviewed POs) and secondary sources (information from successful experiences EMPAER or EMBRAPA have developed or assisted to develop, or from documented experiences in similar contexts). The sizes of the POs were established based on a mapping conducted by EMPAER on the number of existing and functioning POs in Mato Grosso as well of the families associated to such POs.

10. **Exchange rate**. The exchange rate used in the analysis will be fixed at 1 USD = 0.19 BRL computed as an average of the exchange rate prevailing during pre-appraisal mission.

11. **Prices**. Price level expressed in local currency unit for sub-projects inputs and products at farm gate according to average market prices as collected by EMPAER next to prospective beneficiaries or available through updated secondary sources. The analysis was undertaken using nominal constant prices.

12. **Opportunity cost of capital**. A discount rate of 6% for a 12-year period was applied in this analysis to assess the viability and robustness of the investments.

13. The following paragraphs provide a short description of each of the 12 models that were used. Tables 1 and 2 summarize the main indicators that characterize them.

14. **Dairy (commercial and emerging) –** Investment in the dairy value chain is modeled for two types of beneficiary organizations, commercial and emerging:

15. Commercial: A milk processing cooperative with underutilized capacity would invest in 119 families to improve milk productivity and the resilience of their production systems, according to an agro-forestry-livestock model developed by Embrapa. Each family would have in average 17 cows in 20 hectares of degraded pasture. The cows' fertility rates would hover around 30% and they would produce 5 litres of milk per day. The new model would invest in silage production and pasture improvement (including tree shading), and improved genetics. This would result in a reduction of dedicated pastureland to 10 hectares over 5 years (the remaining 10 hectares would naturally regenerate), in the increase in production per cow per day to 10 litres per day and in a fertility rate of 68%.

16. In order to receive the milk that would be produced in excess, the cooperative would be supported with a

refrigerated truck and 6 refrigeration tanks of 1000l. An investment would also be made in renewable energy to reduce processing energy costs and in the acquisition of equipment to provide silage production services to members.

17. Emerging: The base model consists of investing in 119 families belonging to a producer organization to improve milk productivity and the resilience of their production system. The 119 families would own in average 8 cows in 10 hectares and the project would invest in primary production according to the model described above. In order to refrigerate the milk that would be produced in excess, the association would be supported with additional cooling tanks and respective shed, as well as milk analysis equipment.

18. In both cases, the adoption of improved pastureland would reduce land requirements and increase tree cover and thus produce climate change mitigation benefits. The increase in productivity per animal would also decrease the carbon intensity of the milk that is produced.

19. **Cassava (emerging)** – The project would invest in a producer organization with 51 producers who would be supported in adopting best practices. In particular, the project would invest in planting and harvesting equipment and support with the purchase of inputs for 2 hectares per family in the first year. Productivity would increase from 14 to 20 tons per hectare after 2 cycles.

Fruit tree crops (commercial and emerging) – Two models were considered for this subsector:

20. Emerging, only primary production – The producer organization would work with 33 members and invest in 0.5 hectare of fruit plantations in each of them. The plantation would be improved with seedlings adapted to local conditions, construction of dams or well drilling, and installation of a drip irrigation system. For the first year, the project will also support the acquisition of inputs and technical assistance for irrigated fruit crop production, with a focus on fertilization and integrated pest management. Sales would be conducted individually to grocers and processing units, but possibly organized by the association.

21. Commercial, primary production and fruit pulp production – The project would invest in an existing small-capacity fruit pulp unit currently producing 20 ton of fruit pulp per year. The investment would increase capacity to 400 ton per year and make it compliant with food safety regulations. The main equipment includes: fruit pulp extraction equipment, industrial freezers, fruit washing and cutting equipment and solar panels for electricity production. The unit would be supplied by its 33 members with fruit from one ha of irrigated orchards which would also be supported with investment according to the model described above.

22. **Fruits and vegetables (emerging)** – The investment would be made in an association by 73 small producers who would produce in common or individual areas (backyards up to 300 m2). The project would invest at farm level in localized irrigation, improvement of production practices (soil management and fertilization, IPM, and irrigation), and farm equipment. All these would contribute to increased yields, and reduction of production losses, which in turn are expected to reduce carbon intensity per dollar and caloric unit produced.

23. The sale of vegetables would be carried out individually in local markets and fairs, but organized by the association, which would manage a number of fair stalls for members and a vehicle for transporting production. The association would be supported with a vehicle for transport of production.

24. **Cocoa (emerging)** – The investment was modeled for an association of 29 small producers who would plant one hectare of cocoa per family under an agro-forestry system with banana (fruit with a quick return and providing initial shading) and trees capable of shading in the longer run (andiroba for commercial oil seeds). In the first year, the tree rows would be inter-cropped with maize and cassava. The intervention is expected to be resilient to climate shocks as

the project would invest in irrigation equipment and improved production practices (IPM, pruning, fertilization). Additionally, the project would introduce improved post-harvest practices, in particular for the high-quality cultivars whose fruits may fetch a premium in the market. In those cases in which shading is increased or new plantations are made on bare land, the project will yield positive GHG emission mitigation effects from changes in land use.

25. **Coffee (emerging)** – The investment was modeled for an association of 62 small producers. Each producer is supported in rejuvenating and improving the management of two hectares of existing coffee plantations. The investment includes building a dam or drilling a well, as well as the installation of an irrigation system. During the project, the coffee will continue to be dried on the farm or designated productive area and pulped and processed after it is sold, but the organizations will be strengthened so that in the future they will be in a position to process the coffee themselves. The intervention would also increase resilience to climate shocks and reduce GHG emissions per dollar generated.

26. **Honey (commercial)** – The model for honey production considers an investment in both primary production improvement and honey extraction and commercialization. The project would invest in an association of 24 honey producers with the intention of becoming a cooperative or be able to commercialize the production individually to a grocer. The investment would include increasing the number of hives per family from 10 to 25 and improving productivity by improving reproduction, feeding and management practices. The project would also invest in adapting an existing shed and equipment for a certified honey extraction unit. Honey would be sold in buckets to a honey grocer. The project would support grocers that would enter the commercial alliance with the association by hiring a technician to supervise and coordinate production.

27. Key performance indicators for all models are shown in tables 1 and 2 and in figures 1 and 2.

Table 1: Summary of incremental results of financial models (with project - without project)

	Investment project (a)	Investment beneficiary	% project	FIRR	FNPV	Net Margin per family /year(b)	Return on labor/family /year(c)
Primary production – models for one family							
Milk production*	21,000	5,000	80%	31%	107,000	41,000	78,000
Milk production**	18,000	2,000	90%	26%	50,000	21,000	38,000
Cassava**	14,000	4,000	80%	39%	14,000	7,000	8,000
Fruit tree crops*/**	32,000	6,000	70%	22%	30,000	28,000	39,000
Fruit & vegetable**	3,000	500	90%	124%	14,000	4,000	7,000
Coffee**	31,000	6,000	80%	31%	44,000	18,000	20,000
Cocoa**	36,000	2,000	90%	35%	33,000	27,000	32,000
Beekeeping*	8,000	1,000	90%	29%	7,000	9,000	12,000
Processing – models for a producer organization							
Dairy plant*	2,320,000	590,000	80%	14%	2,043,000	12,000	14,000
Milk refrigeration**	108,000	12,000	90%	(b)			
Pulp producing unit*	260,000	65,000	80%	43%	4,268,000	42,000	44,000
Honey extraction*	49,000	12,000	80%	113%	392,000	3,000	3,000

Notes: (a) Does NOT include investment in technical assistance (technicians and rural development agents)
(b) Values once the project achieves maturity (4th year).
(c) Investment in refrigeration does not generate benefits per se, it only enables selling the milk that is produced – aggregated results of primary production + refrigeration are shown below.
Commercial organization.
** Emerging organization.

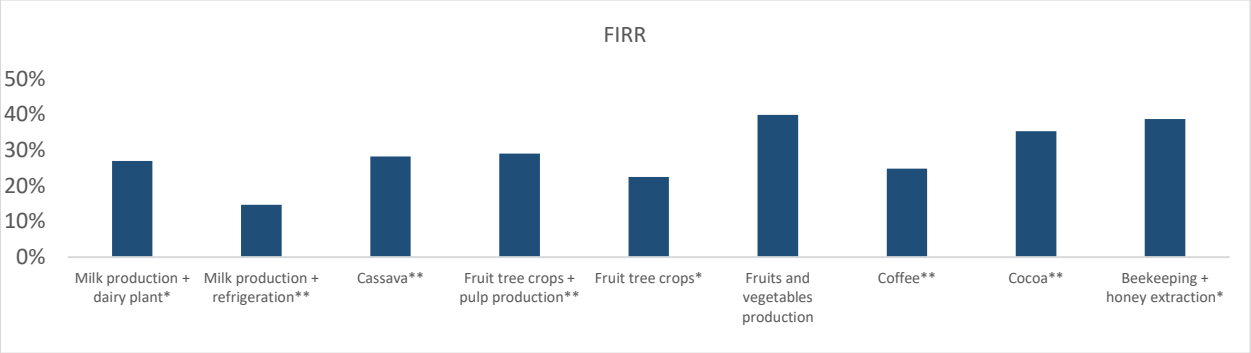
Figure 1: Investment and Internal rate of return for each model (above) and financial results per family (below).

Table 2: Summary of the aggregated models per producer organization (primary production + processing)

	Number of beneficiaries	Total investment	Investment per family	% project	FIRR	FNPV (R$ million)
Milk production + dairy plant*	119	9,095,000	76,000	80%	19%	132.8
Milk production + refrigeration**	119	4,878,000	41,000	90%	15%	2.3
Cassava**	51	720,000	948,000	90%	28%	0.8
Fruit tree crops + pulp production*	33	1,579,000	48,000	80%	29%	4.3
Fruit tree crops**	33	627,000	19,000	90%	23%	0.8
Fruit and vegetable production	73	421,000	6,000	90%	40%	0.7
Coffee**	62	-	-	90%	25%	2.3
Cocoa**	29	1,091,000	38,000	90%	35%	1.5
Beekeeping + honey extraction*	24	256,000	11,000	80%	39%	0.4

+ Results considering 65 percent adoption rate within each organization.
* Commercial organization.
** Emerging organization.

Figure 2: Financial rate of return for the aggregated models per producer organization - primary production + processing for all families within the organization (adoption rate of 65%).



28. The selected models demonstrate that there are opportunities to finance feasible investments in each of the selected value chains. As expected, the highest IRRs are obtained for the smallest investments (where marginal gains are still high), namely in fruits and vegetables and in honey (both above 100%). However, these, together with cassava show the most modest impacts on family income (increase in net margins below R$ 10,000 in all cases). On the other hand, the improvement of milk production provides an opportunity to make considerable changes in family income (increases in net margins of R$21,000 and R$41,000, for 8 and 17 cows' farms, respectively), should prices remain stable. Despite presenting positive results, all models represent a number of risks that should be taken in consideration during project implementation:

29. **Milk**: The proposed models require working capital for the purchase of inputs for the silage crops and for improved pasture management (R$ 13,000/year for the commercial model). The increase in milk production will require investment capacity in a milking parlor in the third year after project implementation (R$25,000). Additionally, the adoption of the new production system requires an important and gradual shift in practices that can only be sustained with continuous and timely technical assistance. The model is conservative in terms in increase in production, but it is also relatively sensitive to changes in production costs. Should the project not be able to select motivated farmers, facilitate access to credit, and provide effective technical assistance, the expected results may not materialize.

30. **Cassava**: The model is based on the intensification of production. Such model should be only promoted next to families who can sell the cassava roots to a well-identified market. Families who cultivate cassava almost exclusively for self-consumption will have no incentive to adopt more expensive practices to increase production, and may abandon them once the project inputs have been used.

31. **Fruit tree crops**: The models are sensitive to changes in the value of production, i.e. to harvest and post-harvest losses and decreases in prices at primary levels. At processing level working capital needs will be very high, particular to secure the supply (and payment) of fruit from its members (R$ 400,000 for the second year). The project must be capable to (i) ensure adequate technical support to primary production, and most importantly, (ii) ensure access to credit, and (iii) ensure rapid turnover of fruit pulp (due to limited refrigerated storage capacity) and (iv) short payment periods from clients (to decrease needs in working capital). Investment in increased management capacity is of foremost importance for the success of this type of businesses.

32. **Fruits and vegetables**: This analysis modelled a small production of fruit and vegetables that can be managed by one element of a family and easy to sell in local markets – this is important as fruits and vegetables are labor-intensive perishable products. However, it is essential that the project promotes cooperation, rather than competition, amongst the beneficiaries to place the products in market. Only through organized sales, will the members of the producer organization attain the reduced post-harvest losses and sales values described in the model.

33. **Coffee**: Increased productivity of coffee plantations requires conducting heavy pruning every 7 years (to remove unproductive parts that waste nutrients). The years after pruning are of lower yields. Yields increase progressively, peaking on year 5 and then start decreasing. If a farmer is to keep a constant level of income, it will need to prune its orchard in phases, keeping always a share of the plants in each growth stage. Otherwise, inter-year yield and income variations will be high and farmers may have problems managing their working capital. The project needs to be effective in assisting the farmers in designing their own 7 years farm management plan and help them through the first years of implementation. Otherwise, the risk of low adoption is high.

34. **Cocoa**: The model presented for cocoa is of low risk (and conservative in its results). However, it will be a new production system for many farmers and needs to be followed up by well-trained technical assistance to ensure high levels of adoption.

35. **Honey**: Production and extraction of honey are not separable activities (honey needs to be extracted to be sold and consumed) and must be analyzed together. Large investments in primary production are difficult to make in one year only, as swarms need to be multiplied into the new hives and (i) there is only so many new swarms that can be produced from the original ones, (ii) swarms used for multiplication will produce less that year. This means that it is unfeasible to make investments in large extraction units that will then spend years underutilized. Hence the model adopted a small production (from 10 to 25 hives per producer, with 22 hives producing honey from the fourth year). The model also was conservative in the marketing capacity of such units and assumed that sales would be done in buckets (no brand or differentiation) to a grocer or packing house. Developing a brand and selling directly to retailers would require constant volumes from the start, a high investment in marketing, and higher needs in working capital for packaging, which would possibly be beyond the immediate capacity of the majority of producer associations in Mato Grosso.

Table 3 - Sensitivity analysis: switching values for benefits and input costs per model

	Benefits switching value	Input costs switching value
Primary production – models for one family		
Milk production – commercial	54%	17%
Milk production - emerging	48%	12%
Cassava	92%	14%
Fruit tree crops - commercial	88%	32%
Fruit tree crops - emerging	89%	22%
Fruit and vegetables	41%	108%
Coffee	74%	50%
Cocoa	41%	65%
Beekeeping	22%	17%

Economic Analysis

36. The objectives of the economic analysis are: (i) to examine the overall project viability, and (ii) to assess its overall economic rate of return; and (iii) to perform sensitivity analyses upon variables affecting project's results. Key phases and assumptions will include:

37. **Phasing-in of beneficiaries and project total cash flow**. The results of a survey undertaken by EMPAER suggest that there is a total of 406 producer organizations (POs) operating in the project key value chains in the 61 municipalities targeted by the project, with a total of about 27,700 members. The analysis assumes that the project will invest in 128 POs. These 128 POs are distributed throughout the 8 selected value chains and 2 typologies in a similar proportion to the 406 surveyed. Average membership per value chain is also considered to be about the same for the surveyed POs. Table 4 summarizes these assumptions.

Table 4: Subprojects and investment per subsector and typology (investment in USD million in financial prices)

	Number of Pos/typology		Average # of families	Total investment (USD million)		
	Commercial	Subsistence		Commercial	Subsistence	Total
Dairy	15	34	119	17.0	16.5	33.5
Cassava	0	6	51	-	1.1	1.1
Fruit tree crops	9	21	33	2.7	2.5	5.3
Fruit and vegetables	0	20	73	-	1.6	1.6
Cocoa	0	9	62	-	0.6	0.6
Coffee	0	3	29	-	3.9	3.9
Beekeeping	4	0	24	0.2	-	0.2
Non-Timber forest products	0	7	26	-	0.7	0.7
0	**28**	**100**	**74**	**19.9**	**27.0**	**46.9**

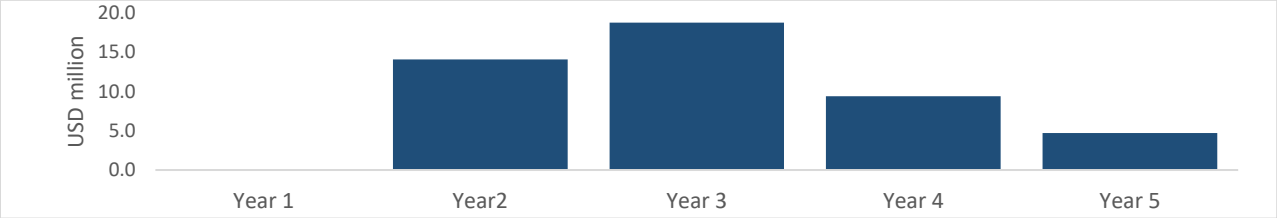
38. It is assumed that total project investment in Component 1 will be phased-in as follows: 30% in the second year, 40% in the third year, 20% in the fourth year and 10% in the fifth year of project implementation. Average project grant per family is expected to be about USD 9,000 for "commercial" POs, while for "emerging" ones should be USD 3,600 per family. Table 5 summarizes the phasing-in of beneficiaries and project investment through component 1.

Table 5: Subprojects phasing for Component 1 (investment in USD million)

	Assumed implementation timeline					Number of Pos financed						Investment of the project in subprojects*					
	Year 1	Year2	Year 3	Year 4	Year 5	Year 1	Year2	Year 3	Year 4	Year 5	Total	Year 1	Year2	Year 3	Year 4	Year 5	Total
Dairy (commercial)		30%	40%	20%	10%	0	4	6	3	1	15	0.0	5.1	6.8	3.4	1.7	17.0
Dairy (subsistence)		30%	40%	20%	10%	0	10	14	7	3	34	0.0	4.9	6.6	3.3	1.6	16.5
Cassava		30%	40%	20%	10%	0	2	2	1	1	6	0.0	0.3	0.4	0.2	0.1	1.1
Fruit tree crops (commercial)		30%	40%	20%	10%	0	3	4	2	1	9	0.0	0.8	1.1	0.5	0.3	2.7
Fruit tree crops (subsistence)		30%	40%	20%	10%	0	6	8	4	2	21	0.0	0.8	1.0	0.5	0.3	2.5
Fruit and vegetables		30%	40%	20%	10%	0	6	8	4	2	20	0.0	0.5	0.6	0.3	0.2	1.6
Cocoa		30%	40%	20%	10%	0	3	4	2	1	9	0.0	0.2	0.3	0.1	0.1	0.6
Coffee		30%	40%	20%	10%	0	1	1	1	0	3	0.0	1.2	1.6	0.8	0.4	3.9
Beekeeping		30%	40%	20%	10%	0	1	2	1	0	4	0.0	0.1	0.1	0.0	0.0	0.2
Non-Timber forest products		30%	40%	20%	10%	0	2	3	1	1	7	0.0	0.2	0.3	0.1	0.1	0.7

* share of the subprojects financed by the project excluding technical assistance costs

Figure 3: Assumed disbursement in project Grants



39. The economic cash flow of the project corresponds to the addition of the cash flows of all subprojects according to the projected phasing. All subprojects for the same products are assumed to have the same cash flow as the identified illustrative case.

40. **Key parameters**. Production and activity models considered in the financial analysis are used as building blocks for determining the viability of the whole project, once addressing for market distortion and opportunity costs for inputs and outputs.

(i) Project life has been set at 15 years, in light of investments lifecycles;
(ii) An economic discount rate of 6% is used;
(iii) Standard Conversion Factor were calculated for main inputs and outputs from estimated import/export parity prices; the Shadow Exchange Rate (SER) has been estimated to be 5.2 R$/USD;
(iv) The opportunity cost of unskilled labour was estimated considering the current long term unemployment rate 4.4%.

41. **Project Economic Costs**. Technical assistance and managerial and operational costs, as well and beneficiaries' contribution to the investment were added to the cash flow.

42. **Benefits Estimation**. The incremental benefits stream comprises the economic net values of all the models developed in the financial analysis (with project scenario minus without project scenario). These economic benefits are aggregated following the phasing in Table 2. Environmental externalities in the form of increased carbon storage or avoided emissions have been computed applying the Ex-act to the changes described in the illustrative models and amount to an average of -430,249 tCO2-eq/year.

43. Following the most recent World Bank guidelines[94], the project's economic analysis indicators were estimated using a higher carbon price (HCP) assumption (USD 80/tCO2-eq) and a lower carbon price (LCP) assumption (USD 40/tCO2-eq) to estimate economic benefits from reducing GHG.

44. **Sensitivity Analysis**. The robustness of these economic indicators was tested and confirmed with a sensitivity analysis that produced switching values for cost increases and benefit reduction for the HCP, LCP and baseline scenarios.

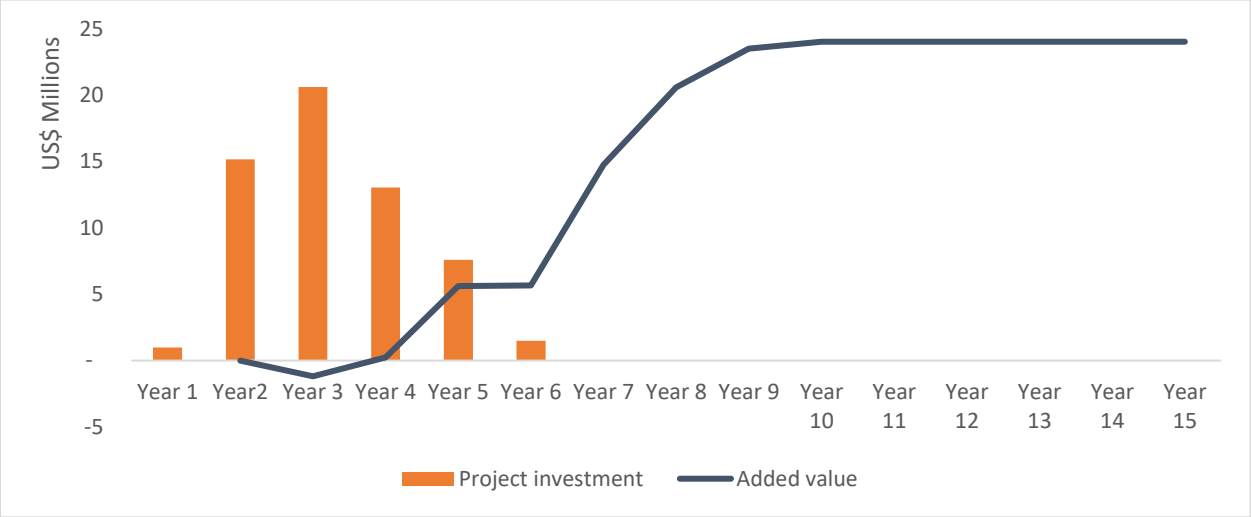
45. **Results**. In the baseline scenario described above the project yields a 20 percent economic internal rate of return and a net present value of R$ 298 million before accounting for environmental benefits from reducing GHG. The scenarios with economic benefits from reducing GHG are largely positive, signaling the potential carbon markets can have in the future in providing incentives for change (see Table 6). Figure 4 compares the projected project investment with the increase in yearly value added that the project is expected to generate.

Table 6 – Summary of results of the economic analysis

Before Environmental benefits	
Internal rate of return	20%
Net present value (R$ million)	298
Switching value for benefits	-13%
Switching value for costs	16%
Shadow price of carbon at USD 40/tCO2-eq	
Internal rate of return	45%
Net present value (R$ million)	1,667
Switching value for benefits	-55%
Switching value for costs	49%
Shadow price of carbon at USD 80/tCO2-eq	
Internal rate of return (R$ million)	71%
Net present value	2,677

[94] Guidance note on shadow price of carbon in economic analysis. World Bank, September, 2017

Figure 4: Projected project investment and increase in yearly value added that it is expected to generate



ANNEX 5: Greenhouse gas analysis

Background and Methodology

1. In its 2012 *Environment Strategy*, the World Bank adopted a corporate mandate to conduct greenhouse gas (GHG) emissions accounting for investment lending. The quantification of GHG emissions is an important step in managing and ultimately reducing GHG emissions, and is becoming a common practice for many international financial institutions. The World Bank adopted the Ex-Ante Carbon-balance Tool (EX-ACT), which was first developed by the Food and Agriculture Organization of the United Nations (FAO) in 2010 to assess the impact of agricultural and rural development investment lending on GHG emissions and carbon sequestration.[95] EX-ACT allows the ex-ante assessment of a project's net carbon-balance, defined as the net balance of CO2 equivalent GHG that would be emitted or sequestered as a result of project implementation compared to a without project scenario. EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of CO2 per hectare and year.

2. The following analysis uses the Ex-Act tool to assess the GHG impacts associated with the activities included in the proposed project.

Application of EX-ACT

3. **Project boundaries**. The project will finance support for family farming including market access as well as strengthen the enabling environment for sustainable, climate-smart farming. The GHG analysis is based on the family farming business models that have been selected for the sub-projects to be financed under Component 1 (Support for sustainable, climate-smart and inclusive family farming and market access) and that are covered by the detailed Economic and Financial Analysis (EFA) for the project.

4. The business plans supported by the project will be designed, evaluated and selected based on criteria including productivity, competitiveness, inclusion and resilience. Regarding climate action, the project will promote investments that increase the beneficiaries' resilience and at the same time contribute to GHG emissions' reduction and/or carbon sequestration. The intention of the project is to maximize the likely co-benefits of investments. The actual characteristics of the investments of the project and of their impacts will only be known once business plans are built during project implementation. The scenario of project implementation adopted in this analysis is the same as that used for the project EFA. Table 1 summarizes some characteristics of the family farming business models used to assess the GHG mitigation potential and the EFA.

5. The family farming business models analyzed for Component 1 are the following: 1) Commercial dairy production; 2) Emergent dairy production; 3) Improved cassava growing; 4) Commercial Fruit tree crops; 5) Emergent Fruit tree crops; 6) Vegetable gardening; 7) Coffee cultivation; 8) Cocoa agroforestry; 9) Beekeeping; and 10) Non-Forest Timber Products. The Greenhouse Gas (GHG) implications of all the sub-projects with land use implications (1, 2, 3, 4, 5, 6, 7, 8) are covered in detail in this Ex-ACT analysis. For business models 1 and 4, GHG implications of using electricity generated by solar power were also calculated (see Ex-ACT sheet 9.2).

6. According to the model adopted, the project intends to finance at least 128 subprojects for the benefit of producer organizations, whose membership comprises at least 9,000 family farmers, including indigenous peoples, *Quilombolas*, and other "traditional communities" identified by the project.

[95] The current version of the EX-ACT tool, 9.3.5, was issued in 2022.

Table 1: Family Farming Business models with land use implications – Component 1

Family Farming Business Model*	Characteristics				
	Productive investment Groups sub-projects	Vulnerable Groups sub-projects	Average Number of farmers per group	Total number of farmers	Total hectares dedicated to sub-projects
1) Commercial dairy	15		119	1,749	22,737
2) Emergent dairy		34	119	4,080	28,560
3) Improved cassava growing		6	51	306	614
4) Commercial Fruit tree crops	9		33	294	294
5) Emergent Fruit tree crops		21	33	687	343.5
6) Vegetable gardening		20	73	1,467	43.8
7) Coffee cultivation		9	62	554	1,108
8) Cocoa agroforestry		3	29	86	86
TOTAL	24	93		9,223	53,809.2

*The numbering of the family farming business models follows that of the EFA for ease of reference. Multiplications of groups and average number of farmers per group may not exactly match total numbers of farmers due to rounding.

7. As can be seen in Table 1, the sub-projects affect a total area of 53,809.2 hectares (ha). In brief, the sub-project interventions with implications on GHG fluxes are as follows:

- 1 and 2, dairy production: conversion of 51,297 ha of degraded pastureland to silvopasture (37,890 ha) and to improved annual cropping (13,407 ha)[96]
- 3, conversion of 614 ha of traditional cassava to improved cassava growing[97]
- 4, 5 and 6, conversion of 684 ha of extensive cropping to irrigated horticulture/agroforestry (640 ha) and irrigated vegetable gardening (43.8 ha)
- 7, coffee cultivation: rehabilitation of 1,108 ha of neglected coffee plantations through hard pruning and fertilization
- 8, cocoa agroforestry: conversion of 86 ha of non-forest land to shade cocoa[98]

8. The technical and organizational capacities to assist family farming groups to attain the projected climate co-benefits are considered in the TA for the sub-projects (included in Component 1) and institutional strengthening activities of State-level entities supporting family farming (included in Component 2).

9. **Data source.** The main sources of data used to carry out the analysis include information generated in the Economic and Financial Analysis (EFA) as well as technical inputs prepared mainly by government officials and state research agencies. These inputs provide, amongst others, a detailed assessment on the technical packages on dairy, crops, horticulture and agroforestry production systems that will be supported by the project.

10. **Basic assumptions**. Mato Grosso has a tropical climate. The project municipalities are concentrated in the Amazon and Pantanal regions, which have a wet regime. The dominant soil type is clay soil. The timeframe of project

[96] For technical details, see *https://ainfo.cnptia.embrapa.br/digital/bitstream/item/79415/1/COT29.pdf*
[97] For technical details, see *https://www.noticiasagricolas.com.br/cotacoes/mandioca/mandioca-raiz-ao-produtor*
[98] For technical details, see *https://www.bnb.gov.br/s482-dspace/bitstream/123456789/650/3/2021_CDS_149.pdf*

implementation is 6 years and the capitalization phase is 14 years, thus the analysis period is set for a total of 20 years. Dynamics of evolution are assumed to be linear for most of the variables. Default "Tier 1" coefficients were used for the Ex-ACT estimate. The construction of 'with-out project situation' and 'with project situation' trajectories is based on technical references included in the EFA, which are mainly derived from EMBRAPA as well as experts' opinions (to verify the fitness of technical assumptions).

11. **Livestock**. The project will support dairy farming (models 1. and 2). The project is expected to introduce improved breeding and feeding leading to higher milk production, without increasing livestock numbers nor the pasture area. It will also promote other management practices contributing to climate change mitigation and adaptation, such as better management of production areas, from introducing tree cover for shade to improved cropping and manure management The main GHG emissions reductions, however, will result from the conversion of 51,297 ha of degraded pastureland to silvo-pasture agroforestry (37,890 ha) and to improved annual cropping (13,407 ha) for the production of cattle feed.

12. **Annual and perennial crops production** (models 3, 4, 5, 6, 7 and 8). The technical guidelines proposed for both annual and perennial systems incorporate "improved agricultural technologies and practices" that contribute to GHG mitigation, while enhancing climate resilience.

13. The Ex-ACT tool incorporates a selection of improved agricultural technologies and practices for annual crops production; these include improved agronomic practices, nutrient management, no till & residue retention, manure application and water management. It is estimated that at least 2,489.30 hectares of annual and perennial crops will be subject to improved agricultural technologies and practices.

14. The Ex-ACT tool also takes into account improved perennial systems: agro-forestry, orchards, and shade cocoa and supports other technologies and practices that are framed within the climate smart agriculture approach.

15. **Inputs**. In its analysis, the EX-ACT tool considers four types of inputs: 1): agricultural inputs (such as fertilizers and others); 2) energy consumption (electricity); 3) irrigation infrastructure; and 4) buildings and roads. The first three types of inputs will be promoted by the project and their GHG emissions implications have been analyzed in Ex-ACT. As for item 4, this has not been included in the Ex-ACT analysis, as the project will not fund roads, and it will mainly fund rehabilitation and re-equipment of existing buildings, rather than new buildings.

16. Agricultural inputs. The available technical guidelines in crop production include the use of improved seeds, fertilizers and pest control management. The amounts (tons per year) of fertilizers (other N-fertilizers, phosphorus and potassium), herbicides, insecticides and fungicides were calculated based on data sources used for the project EFA. The data was available per hectare for a number of annual and perennial crops. The average amounts of inputs (in tons per year) for annuals and perennials were multiplied by the projected area for each of the business models 4, 5, 6, 7 and 7 (total area 2,489.30 ha) mentioned in Table 1 above. The project provides technical support to make a more efficient use of inputs and apply alternative methods to reduce the need for agrochemicals. As mentioned above, there are a number of highly effective and applicable practices in the frame of the climate smart agriculture approach.

17. Energy consumption. The estimates of energy consumption for all investments included in the Ex-ACT analysis consider the increased scale of production and infrastructure supported through project interventions. They also take into account improvements in terms of the use of new technologies and other investments required to make a more efficient use of resources. The project intends to enhance the efficiency of the existing processing units through the modernization of equipment and the use of renewable energy (solar panels), as well as the improvement of the quality of the produce of family farmers that is processed in these units. The main increase in energy consumption will result from the investment in irrigation systems, which are accounted for separately in Ex-ACT (see below).

18. Irrigation infrastructure. Under Component 1, the project will support the construction and/or improvement of irrigation systems for the family farmer beneficiaries, and also the improvement of agro-processing, focusing on optimization of existing processing units rather than creating new ones.

Results

19. **Net carbon balance.** The project leads to estimated annual climate change mitigation benefits of 661,922 tCO2e, when compared to a business-as-usual baseline scenario. This is equivalent to annually reduced GHG emissions per hectare of 12.3 tCO2e. After 20 years, GHG mitigation benefits amounting to a reduction of 13,238,436 tCO2e will be generated. The main results of this GHG analysis are summarized in Table 2.

20. Assuming an adoption rate of 65 percent as in the EFA, the actual expected GHG mitigation benefits from land use change would be 430,249 tCO2e annual and 8,604,983 tCO2e in total after 20 years.

21. **Carbon sources and sinks**. The main carbon sources come from infrastructure and inputs (liming and fertilizers). The sequestration benefits come principally from conversion of degraded pasture lands to silvo-pasture agroforestry and improved cropping, and to a lesser extent from conversion of extensive cropping to horticulture and shade cocoa as well as improved technologies and practices in cropping systems (annual and perennial crops).

Table 2: Results of the ex-ante GHG analysis in tCO_2-eq

Project components	Gross fluxes			Share per GHG of the Balance					Result per year		
	Without	With	Balance	All GHG in tCO2eq					Without	With	Balance
	All GHG in tCO2eq			CO_2			N_2O	CH_4			
	Positive = source / negative = sink			Biomass	Soil	Other					
Land use changes											
Deforestation	0	0	0	0	0	0	0	0	0	0	0
Afforestation	0	0	0	0	0	0	0	0	0	-0	0
Other LUC	0	-5,331,749	-5,331,749	-47,184	-5,284,565	0	0	0	0	-266,587	-266,587
Agriculture											
Annual	363	-34,551	-34,914	0	-67,993		33,079		18	-1,728	-1,746
Perennial	-233,295	-9,162,793	-8,929,498	-7,952,424	-977,074				-11,665	-458,140	-446,475
Grassland & Livestock											
Grassland	0	0	0	0	0		0	0	0	0	0
Livestock	0	0	0				0	0	0	0	0
Inputs & Investments	471,135	1,528,860	1,057,725		245,709	301,078	510,937	0	23,557	76,443	52,886
Total	238,203	13,000,233	13,238,436	-7,999,607	-6,083,923	334,158	510,937	0	11,910	-650,012	-661,922
Per hectare	4.4	-241.5	-245.9	-148.6	-113	6.2	9.5	0			
Per hectare per year	0.2	-12.1	-12.3	-7.4	-5.7	0.3	0.5	0			

22. The use of electricity generated by fossil fuels in the project area is estimated at 71.26 MWh/year in the "without project scenario". In the "with project" scenario, the energy demand will increase based on investments in enhancing primary production and improving agro-processing. The demand is projected to increase from 106 MWh/year in the first year of the project to 309 MWh/year after three years, and then stabilizing at that level.

23. The renewable energy investment in the first year of the project is expected to generate an estimated 106

MWh/year, accounting for 34% of the energy demand of the processing units by the end of year 3. Therefore, only 203 MWh/year of the 309 MWh/year required annually will have to come from the public grid, with its associated fossil fuel emissions.

24. **Sensitivity analysis**. The uncertainty of the carbon balance, as calculated by ExACT-Tool, is 41%. This analysis was run using mostly tier 1 coefficients, which in some cases may provide over or underestimated values. It is a relevant source of uncertainty in the estimation of GHG emission/sequestration scenarios for the project.

ANNEX 6: Map of project intervention areas

Figure 1: Project intervention areas in Mato Grosso