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Report No: PAD4582

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF US$35.5 MILLION

TO THE

ORIENTAL REPUBLIC OF URUGUAY

FOR THE

URUGUAY AGRO-ECOLOGICAL AND CLIMATE RESILIENT SYSTEMS PROJECT

November 4, 2021

Agriculture And Food Global Practice
Latin America And Caribbean Region

CURRENCY EQUIVALENTS

Exchange Rate Effective June 02, 2021

Currency Unit =	Uruguayan Peso (UYU)
UYU 44 =	US$1
UYU 1 =	US$0.0227

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

CO_2	Carbon Dioxide
CO_2eq	CO_2 equivalent
CONAPROLE	National Cooperative of Milk Producers (*Cooperativa Nacional de Productores de Leche*)
CPF	Country Partnership Framework
CTA	Agro-ecological Transition Committee (*Comite de transición agroecológica*)
DACC	Sustainable Management of Climate Change and Natural Resources Project (*Desarrollo y Adaptación al Cambio Climático*)
DGDR	Directorate-General of Rural Development of MGAP (Dir*ección General de Desarrollo Rural*)
DGRN	Directorate-General of Natural Resources of MGAP (*Dirección General de Recursos Naturales*)
DGS	Directorate-General of Secretaries of MGAP (*Dirección General de Secretaría*)
DGSA	Directorate-General of Agriculture Services of MGAP (*Dirección General de Servicios Agrícolas***)**
DIGEGRA	Directorate-General of Farms of MGAP (*Dirección General de la Granja*)
EIRR	Economic Internal Rate of Return
ESCP	Environment and Social Commitment Plan
ESMF	Environment and Social Management Framework
ESS	Environmental and Social Standards
FAO	United Nations Food and Agricultural Organization
FM	Financial Management
GDP	Gross Domestic Product
GHG	Greenhouse Gases
DMA	Phytosanitary Applications Management and Monitoring System (*Dispositivo de Monitoreo de Agroquimicos*)
GoU	Government of Uruguay
GPS	Global Positioning System
Ha	Hectare
ICT	Information Communication Technology
INALE	National Milk Institute (*Instituto Nacional de la Leche*)
INBA	Institute of Animal Welfare (*Instituto Nacional de Bienestar Animal*)
INEFOP	National Institute for Employment and Professional Training (*Instituto Nacional de Empleo y Formación Profesional*)
INIA	National Agricultural Research Institute (*Instituto nacional de investigación agropecuaria*)
M&E	Monitoring and Evaluation
MGAP	Ministry of Livestock, Agriculture and Fisheries **(***Ministerio de Ganadería, Agricultura y Pesca*)
MOE	Ministry of Environment
NDC	Nationally Determined Contribution
NPV	Net Present Value
NRMS	Natural Resources Management System
OPYPA	Office of Agricultural Policy and Planning (*Oficina de Programación y Política Agropecuaria*)

PMU	Project Management Unit of MGAP
POM	Project Operational Manual
PPSD	Project Procurement Strategy for Development
RENAC	National Registry of Companion Animals **(***Registro Nacional de Animales de Compañía*)
SNIA	National System of Agricultural Information (*Sistema Nacional de Informacion Agropecuaria*)
SNIG	National System of Livestock Information (*Sistema Nacional de Informacion Ganadera*)
tCO_2eq	Tons of Carbon dioxide equivalent
ToR	Terms of Reference
UN	United Nations
UNDP	UN Development Programme
UNFCCC	UN Framework Convention on Climate Change
UYU	Uruguayan Peso

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Uruguay	Uruguay Agro-Ecological and Climate Resilient Systems Project	
Project ID	**Financing Instrument**	**Environmental and Social Risk Classification**
P176232	Investment Project Financing	Moderate

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
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
30-Nov-2021	30-Nov-2026

Bank/IFC Collaboration

No

Proposed Development Objective(s)

(i) strengthen agricultural public systems and rural producers to increase climate change adaptation and mitigation actions and promote Agro-ecological production; and (ii) respond effectively in case of an Eligible Crisis or Emergency.

Components

Component Name	Cost (US$, millions)

Component 1: Strengthening Decision Support Systems for Climate Resilience	30.11
Component 2: Supporting a Transition to Agroecological Production	19.60
Component 3: Project Management	2.70
Component 4: Contingent Emergency Response	0.00
Front end Fees	0.09

Organizations

Borrower:	Oriental Republic of Uruguay
Implementing Agency:	Ministry of Livestock, Agriculture and Fisheries (MGAP)

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	52.50
Total Financing	52.50
of which IBRD/IDA	35.50
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	35.50

Non-World Bank Group Financing

Counterpart Funding	17.00
Borrower/Recipient	11.00
Local Beneficiaries	6.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2022	2023	2024	2025	2026	2027
Annual	1.50	3.00	5.00	8.00	8.00	10.00

Cumulative	1.50	4.50	9.50	17.50	25.50	35.50

INSTITUTIONAL DATA

Practice Area (Lead)

Agriculture and Food

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

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

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 Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Relevant
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 Covenants

Sections and Description

Schedule 2, Section I, A.1: The Borrower, through MGAP, shall operate and maintain, during Project execution, a PMU with organizational structure, staff, functions, and responsibilities satisfactory to the Bank, as set forth in the Operational Manual, for the implementation, coordination and supervision of the Project.

Sections and Description

Schedule 2, Section I, B.1:To facilitate the carrying out of the Part 1.1. of the Project, the Borrower, through MGAP, shall enter into an agreement with each selected Departmental Government, under terms and conditions approved by the Bank, which shall include, inter alia, the Departmental Government's obligation to coordinate the insertion

of microchips in domestic animals and the uploading of information in RENAC system for full traceability in the respective territory, and to carry out its responsibilities under Part 1.1. of the Project in accordance with the terms of this Agreement, the ESCP and the Operational Manual.

Sections and Description
Schedule 2, Section I, C.2: Upon approval of an Agroecological Subproject proposal, the Borrower, through MGAP, shall enter into an agreement with the pertinent Eligible Beneficiary, on terms and conditions satisfactory to the Bank.

Sections and Description
Schedule 2, Section I, D.1.a:To facilitate the carrying out of the Part 2.4. of the Project, the Borrower shall make part of the proceeds of the Loan available, on a non-reimbursable basis, to each Project Implementing Entity to partially finance Dairy Producers Subprojects, under an agreement between the Borrower and said Project Implementing Entity, in terms and conditions satisfactory to the Bank, which shall include the Project Implementing Entity's obligation to carry out the Respective Part of the Project in accordance with the terms of this Agreement and the ESCP.

Sections and Description
Schedule 2, Section I, D.2: Prior to the carrying out of any approved Dairy Producers Subproject by an Eligible Beneficiary, the Borrower shall cause the Project Implementing Entities to enter into an agreement with the each Eligible Beneficiary in terms and conditions satisfactory to the Bank.

Conditions

Type	Financing source	Description
Disbursement	IBRD/IDA	Schedule 2, Section III.B, 1.b. For Category (3) -Cuenca Santa Lucia Subprojects: the pertinent Subsidiary Agreement has been entered into with the respective Project Implementing Entity
Type	Financing source	Description
Disbursement	IBRD/IDA	Schedule 2, Section III.B, 1.c :For Emergency Expenditures under Category (5), all of the following conditions have been met in respect of said expenditures: (A) the Borrower has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Bank a request to withdraw Loan amounts under Category (5); and (B) the Bank has agreed with such determination, accepted said request and notified the Borrower thereof; and (C) the Borrower has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Bank.

Type	Financing source	Description
Disbursement		Schedule 2, Section III.B, 1.a: Retroactive financing: For payments made prior to the Signature Date, except that withdrawals up to an aggregate amount not to exceed US$7,100,000 may be made for payments on or after April 1, 2021, for Eligible Expenditures under Category (1);
Type	Financing source	Description
Effectiveness	IBRD/IDA	Article IV. 401: The Operational Manual has been adopted by the Borrower, through MGAP, in a manner acceptable to the Bank.

I. STRATEGIC CONTEXT

A. Country Context

1. **After a decade of inclusive economic growth, Uruguay's economy began to decelerate significantly in 2015.** Between 2004 and 2014, Uruguay experienced its greatest and longest economic expansion in recent history, with average annual Gross Domestic Product (GDP) growth at 5.4 percent. During this period, Uruguay ranked among those countries in Latin America and the Caribbean with the highest per capita income and lowest inequality. From 2015 to 2019, GDP growth decelerated to an average annual rate of 0.9 percent. Investment as a percentage of GDP also fell from 17.0 percent in 2016[1] to 15.4 percent in 2019.

2. **The COVID-19 shock pushed GDP to a 5.9 percent contraction in 2020, the first annual reduction since the 2002 crisis (-7.7 percent)**. Uruguay's quarterly growth was already in negative territory before the COVID-19 shock started to affect exports in the first quarter of 2020. The shock pushed the economy further to a strong and widespread contraction where almost all sectors showed negative growth (except for construction). Sectors sensitive to mobility restrictions and social distancing, such as retail and hospitality, had the greatest impact on GDP contraction (1.2 and 1.7 percentage points, respectively). Primary activities showed a minor contraction of 0.4 percent in 2020. The economy is experiencing a widespread recovery in 2021. Yet, the closing of borders to foreign tourism for the 2021 summer season and the subsequent late COVID-19 surge dampened the prospects of achieving pre-pandemic GDP levels in 2021.

3. **Economic contraction in 2020 had strong repercussions on the labor market, household income, and poverty levels.** The COVID-19 shock worsened already weak labor market conditions, and, in April 2020, labor participation and employment rates were 57.7 percent and 52.1 percent, respectively. These indicators gradually improved throughout the rest of the year to reach 60.5 percent and 54.3 percent on average, though still below pre-pandemic levels (62.2 percent and 56.7 percent on average in 2019, respectively).[2] In this context, and despite the strong pre-existing social safety net complemented by emergency government measures, the poverty rate increased from 8.8 percent to 11.6 percent. The fiscal deficit of the non-financial public sector increased from 3.9 percent of GDP in 2019 to 5.4 percent in 2020.

4. **External demand for Uruguay's products suffered a COVID-related shock in 2020, negatively impacting exports.** Merchandise exports for 2020 (including from Free Zones) totaled US$8.1 billion, 12.5 percent below that observed in 2019 (US$9.2 billion), driven primarily by beef (-11 percent), cellulose (-28 percent) and soybeans (-25 percent). This was mostly the result of a combination of lower exports volumes for beef and soybeans (the latter being strongly affected by droughts) and lower prices for beef and cellulose.

5. **Key exports are rebounding strongly in 2021, largely boosted by the global recovery and higher commodity prices.** Merchandise exports reached US$7 billion in January-August 2021, a 35 percent increase with respect to the same period in 2020 (11 percent growth when compared to January-August 2019), mainly driven by agricultural products: beef (49 percent), wood (92 percent), meat by-products (73 percent) and cellulose (22 percent). Exports to China, which had been heavily affected since the beginning of the pandemic, grew 63 percent over the same period, including a 205 percent increase in beef exports. Strong growth in merchandise exports

[1] Investment estimates for new base of National Accounts (2016) are not available for the period prior to 2016.
[2] Note 2019 and 2020 figures for employment and poverty are not strictly comparable due to the interruption of in-person surveys since the beginning of the pandemic.

helped to partially offset the fall in services exports during the first quarter of 2021 affected by weak inbound tourism, as frontiers remained closed during the 2021 summer season.

6. **Although Uruguay has made significant progress over the last decades promoting equality, important gender gaps remain and have been exacerbated by the COVID-19 shock.** Many indicators related to women's endowments, economic opportunities, and agency have improved over the last decades. However, women still face significant inequalities. Women's participation in the labor market nationally is 53.8 percent compared to 67.9 percent for men; in rural areas it is lower (47.1 percent). There is a clear gender distribution of work in rural areas, with women commonly participating in positions of less responsibility and qualification – mostly in domestic work – but to a very limited extent in agricultural production. In addition, women suffer from higher unemployment and poverty rates compared to their male counterparts, gaps that widened in 2020.[3]

7. **Women face restricted access to productive assets.** Census information about rural land ownership is not sex disaggregated, but the *Instituto Nacional de Colonización* estimates that less than a sixth of rural properties in Uruguay are owned by women[4]. The fact that women are usually not officially land-owners, even when they are the ones actually working the land, in practice means that they are not able to access formal financial institutions for credit. These restrictions in access to productive assets is also present for female entrepreneurs. For instance, a lower proportion of female-owned micro, small and medium sized enterprises own their business space (58 percent against 65 percent among male-owned MSMEs); they are less likely be part of a society with other owners (26 percent compared to 36 percent among male-owners); and a lower proportion has internet or a cell phone with access to internet (68 percent compared to 80 percent among male-owners).

B. Sectoral and Institutional Context

8. **Agricultural land dominates Uruguay**. Uruguay's territory is characterized by concentrated land ownership. According to the most recent Agricultural Census carried out in 2011, there were about 44,800 farm units, occupying around 16.36 million hectares (average farm size of 365.3 ha) and a rural population of only about 107,000 people. Agricultural farm enterprises comprise two main types: (a) family-operated farms (owned or rented), making up 83 percent of agricultural enterprises in the country, occupying about 23 percent of the land, and producing 45 percent of all agricultural output (farming and livestock); and (b) relatively larger commercial enterprises, representing about 17 percent of the farms, controlling 77 percent of the land, and producing 55 percent of total output. About 64 percent of all farming enterprises are managed by the owner, while about 26 percent are rented (about 10 percent of the land is used under various/mixed tenure agreements). About 63 percent of farming units are headed by men (accounting for 42 percent of the land) and about 20 percent are headed by women (with only 11 percent of the land)[5].

9. **Uruguay's agriculture sector accounts for 77 percent of the country's export earnings and is key to national growth and global competitiveness**. Over the period 2005-2015, exports averaged 26 percent of GDP[6], while in 2020 even during the COVID-19 pandemic, agricultural product exports (notably, beef and soya) remained together at around 37 percent of total exports. Rapid export growth has been accompanied by job creation in export sectors, and about 13 percent of jobs are currently linked to primary and agro-industrial production.

[3] The unemployment rate gap between women and men increased from 3.4 percent in 2019 to 3.7 percent in 2020. The poverty gap between women and male-led households increased from 3 percentage points to 3.7 percentage points.
[4] González Perrett and Deus Viana, 2010
[5] According to the last Agricultural Census, about 17 percent of the farm units did not report the gender of the principal responsible for the unit.
[6] World Bank, 2015

Uruguay's agriculture sector far outpaces all other sectors; four main factors drive the competitiveness in Uruguay's agricultural sector: (a) the growing global demand for food, where the economies of some important importing countries (e.g., China and India) have been growing at twice the rates of 30 years ago; (b) a period of stimulating commodity prices; (c) tax incentives that Uruguay recently deployed to stimulate investment, where public policies incentivized growth and productivity and established favorable conditions for the business climate in the sector to consolidate; and (d) the development of the institutional framework linked to the agricultural sector, which has followed a consistent approach over several decades towards promoting technical innovation for removing some of the main constraints to increasing competitiveness. These factors were central for creating an agricultural community with accumulated institutional experience, allowing for innovations both in terms of procedures and organization of work processes, as well as in adapting technologies and varieties of inputs and products to the country's production conditions.

10. **Uruguay's agricultural economy largely consists of the beef and milk subsectors, with 85 percent of agricultural land devoted to rangelands for cattle.** Uruguay is famous for having more cattle than people, with about 3.6 head of beef cattle for every person in 2020. Cattle stocks are also increasing with the 2021 cattle stock up to 12.2 million head, in addition to about 6.6 million sheep (gradually reduced from a record 26 million sheep in the early 1990's). In acknowledgement of the large and growing livestock population in the country and in response to global markets demanding better treatment of animal in productive practices, a 2020 legal amendment catalyzed the creation of the Institute of Animal Welfare (*Instituto Nacional de Bienestar Animal,* INBA)[7] envisioned to help improve animal management and welfare. The COVID-19 pandemic underscored the Institute's importance, now with an increased focus on creating a One Health[8] approach in the Uruguay food system and preventing zoonotic diseases in collaboration with the National Commission for Zoonotic diseases in the Ministry of Public Health.

11. **The agriculture sector has relied on Uruguay's natural resource endowment, but this development model poses a high risk to soil and water resources**. Benefitting from a favorable temperate climate, Uruguay has taken advantage of its abundant fertile land to develop a strong agriculture sector. From 2015 to 2020, the Uruguayan agriculture sector emphasized a model of *Sustainable Intensification*, with the goal of boosting net exports while preserving its natural resources. However, continued intensification coupled with frontier expansion of the agriculture sector in the last decades, with conversion of lands and increased use of fertilizers, has placed increasing pressure on natural resources, particularly on soil and water resources. Within the multiple types of soils in Uruguay, some are more vulnerable, with multiple studies showing that natural grasslands are particularly vulnerable to overgrazing leading to severe risk of soil degradation. In Uruguay, given the size of the herds and the reliance on beef production, cattle ranching puts Uruguay soils at risk and the sustainability of the agricultural model is in jeopardy. The country's water resources also have gone through an increasing level of stress, with water pollution events in two of the most important watersheds over the past years (Santa Lucia and Laguna del Sauce, respectively in 2013 and 2015), which host the largest concentration of Uruguay's dairy farmers and the main source of drinking water for the population.

12. **Weather-related shocks, increasing both in frequency and intensity due to climate change, have become an additional threat to the Uruguayan economy.** With growing adverse social and economic impacts of droughts,

[7] *https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/instituto-nacional-bienestar-animal/instituto-nacional-bienestar-animal*. Law as amended by Law 19.889 (dated July 9, 2020 and published in the Borrower's Official Gazette on July 14, 2020), and by Law No. 19.924 (dated December 18, 2020 and published in the Borrower's Official Gazette on December 30, 2020).

[8] "One Health" is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment. The OneHealth approach can be considered part of the broader Agro-ecological transition in that the promotion of animal health and welfare also contributes to human health, safety and food security.

floods, and other climate shocks, the agriculture sector has witnessed an alarming increase of production losses due to these extreme weather events. Losses through droughts alone were estimated at US$500 million in 2017-2018 which, at the time, was the most expensive disaster in the history of Uruguay. In 2020, MGAP declared an agricultural emergency due to severe droughts. According to an analysis done by the Office of Agricultural Policy and Planning (OPYPA), the 2020 droughts caused a negative impact of between 0.8-1.3 percent of agricultural GDP, mainly due to the low price of exported soy and the increased price for maize and sorghum, which were needed to supplement herd feed in the face of dry grasslands. According to the 2017 National Water Plan (and climate scenarios, the country's average temperature is expected to increase 2.5 degrees Celsius by 2050. These scenarios predict a significant reduction in land productivity and increased impacts on human and animal health and erosion of public infrastructure. Uruguay is also projected to experience increased rainfall variability and flooding, with implications for rain-fed agriculture, livestock productivity and to the viability of current farm practices. The projected annual expected losses from floods are estimated to increase from US$64.2 million in the present day to US$352.8 million in 2030. Of these losses, well over one-half (US$169 million) would be due to climate change, with other demographic changes accounting for the rest.

13. **Climate change is impacting women in agriculture, while barriers to their access to adaptive technologies remain high.** According to a 2019 study done by MGAP together with the United Nations Development Programme (UNDP), women in livestock, dairy and horticulture are aware of climate change and climate variability, but feel they lack the tools and knowledge to respond. Among other constraints, women have more limited access to agriculture knowledge, services and inputs in the sector compared to men[9]. According to MGAP, only 22 percent of beneficiaries of subsidies and technical assistance in the sector are women and they represent 28 percent of total users of existing information tools and systems (ICT). More specifically on ICT, female farmers tend to have less access than male farmers to information tools and systems as both information content and sharing do not meet women's demands and needs (e.g., lack of information on practices and innovation in management, women tend to be unaware of existing information tools and systems including due to more limited access to digital devices and lack of digital skills, etc.). Consequently, men tend to be playing a major role in decision-making over production, while women's performance in the sector are limited and untapped. In this sense, technical assistance in the sector should better target female farmers and their groups to increase their access to tools/technology and meet their specific knowledge needs, in relation to both knowledge content and conditions to access capacity building activities (Annex 5 for more details).

14. **Uruguay has set ambitious targets on climate change in its Nationally Determined Contributions (NDCs) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2017, and the country carefully tracks progress towards these targets**. Agriculture contributes 75 percent of Uruguay's total emissions, with 50 percent coming from enteric fermentation. The NDCs build on the adaptation priorities set out in the National Policy of the National System for Response to Climate Change (SNRCC). Though comprehensive, the policy had a bias towards *ex-post* response rather than *ex-ante* risk reduction, and a fragmented rather than whole-of-government approach to resilience planning. Agriculture-specific NDC commitments include ambitious measures of adaption and mitigation. In the beef subsector, Uruguay has committed to reduce, by 2030, methane (CH_4) emission intensity by 32 percent (per Kg of beef live weight) and nitrous oxide emission intensity by 34 percent with respect to the levels experienced in 1990, using domestic resources (unconditional) (88 percent achieved as of August 2021). Uruguay also committed to avoid carbon dioxide (CO_2) emissions from soil organic carbon in 1 million ha of grassland, 10 percent of the total grassland area, by incorporating good pasture management and herd management practices (65 percent achieved as of August 2021). Through these commitments, Uruguay is pursuing the goal of becoming one of the world's leading low-emissions food producers.

[9] FAO and MGAP, 2021

15. **The Government of Uruguay (GoU) has shown strong leadership and commitment to addressing climate change issues, driven by the desire to support continued agriculture sector growth, while enhancing the health and productivity of its natural resources.** Several countries have emerged as global leaders in the low-carbon production of high-quality beef (e.g., Ireland and New Zealand). In Latin America, Uruguay has kept pace with these leaders through investments in research, technology, innovation, and dedication to low-carbon growth. In 2005, Uruguay was producing food for 9 million people and, in 2016, this number had grown to 28 million people; the country has set the ambitious goal of feeding 50 million people under sustainable practices in 2050 (more than 14 times the current Uruguayan population). Simultaneously, Uruguay has worked on improving cattle production practices and breeding to lower emission intensity. While the total emissions associated with agricultural production in Uruguay are rising, productivity is rising faster than emissions, resulting in lower emissions intensities (i.e., reduced kilograms of CO_2 per kilogram of meat, milk, grain, etc.). New thinking in Uruguay about how to maintain production while minimizing agriculture's impact on national resources has reimagined the future of the agriculture and environmental interface towards a gradual transition to a comprehensive agroecological model.

16. **Agroecology[10] proposes a new paradigm that offers a transition to sustainable food and agricultural systems.** Since its launch on January 1, 2016, the United Nations (UN) 2030 Agenda for Sustainable Development, with its 17 Sustainable Development Goals (SDGs) approved by the 193 member states, reaffirmed the urgent need to take measures and adopt targeted policies to promote a transformative change to overcome present and future global challenges. Agroecology seeks to guarantee food and nutritional security, reduce socioeconomic inequalities, and increase conservation of biodiversity and the associated agricultural ecosystems. While the term is relatively new in Uruguay, the principles have been long cultivated in the country. Past investments in sustainable agricultural production, as evidenced in Uruguay through examples such as Sustainable Dairy Plans[11] and the Soil Use and Management plans[12], have helped Uruguay to build a case for sustainable interactions between plants, animals, people, and the environment, also subscribing to the One Health principles. More specifically, over past years, Uruguay has developed several plans and regulatory frameworks for adaptation and mitigation that served as a basis for future work, including a) National Adaptation Plan b) Environmental and Economic Accounting System c) Bioeconomy strategy and d) National Inventory of Greenhouse Gases (Annex 3.)

17. **Uruguay is strongly committed to building a more efficient, resilient, inclusive, and sustainable agricultural sector.** The agro-ecological Law N° 19.717, approved in December 2018, declared of national interest the promotion and development of production, distribution, and consumption systems based on agro-ecological principles. A National Honorary Commission was created to prepare, coordinate, and supervise the implementation of the National Agroecology Plan. The Commission is chaired by MGAP and includes representatives of several ministries and decentralized institutions, agricultural research agencies, academic institutions, and municipal governments. The recently created Ministry of Environment is also a key partner in the preparation and implementation of the Plan and participates in the implementation of several policies and activities. Consistent with this strategy, the Project aims to invest in public goods, institutions, and systems to allow a field-level transition to agro-ecological programs and practices.

[10] Agroecology is defined by the Food and Agricultural Organization (FAO) of the UN System as the science of applying ecological concepts and principles to manage interactions between plants, animals, humans and the environment for food security and nutrition (FAO 2018).
[11] These *Planes de Lecheria Sostenible* (PLS) became mandatory in June 2017 for the Santa Lucia Basin. It is a tool for the conservation of natural resources, establishing the crop rotations to conserve the soil and control erosion, considering the capacity of use of the soils, the management practices, the sequence of crops and tolerable levels of erosion.
[12] Soil use and management plans were introduced by MGAP (Law 15239 and decrees) as a pilot in 2010 and became mandatory in 2013, requiring all agricultural producers to present a plan for the responsible management, considering soil types, management practices, crop sequence and levels of erosion.

18. **Supporting continued institutional transformation in Uruguay is necessary to keep pace with the next generation of food economy developments and challenges, such as technological advancements and heightened climate change threats.** One Health imperatives have been revealed by the pandemic and increasingly sophisticated markets now demand sustainably and responsibly produced food. While making significant progress towards its *Sustainable Intensification* strategy in the last two decades, this process has also helped identify existing vulnerabilities of Uruguay's agri-food systems based on the export of commodities (fluctuating international prices) and the vulnerability of natural resources. At the same time, the experience gained has made evident some institutional and organizational issues that must be addressed to tackle the urgent threat of climate change and the need to rapidly adapt. The institutional capacities of MGAP need to be further strengthened to design, implement, and evaluate policies for adaptation and mitigation of climate change, as well as the sustainable use of natural resources in the agricultural sector. As such, MGAP requires a strengthening of its capacities to carry out *ex ante* and *ex post* evaluations of various agricultural technologies incorporating the environmental dimension. There are also opportunities for improvement in animal health and welfare, which pose challenges for the future insertion of national agricultural production in global value chains and maintaining levels of global competitiveness. Notwithstanding the GoU's strong interest in an agro-ecological transition to enhance competitiveness and differentiation, based on the environmental value added of its agri-food production system, there are various shortcomings and institutional weaknesses for implementing this strategic line of action.

19. **Uruguay has important goods and services to offer globally but needs to improve information generation and flows.** Uruguay continues to face global competitiveness challenges (mainly to reduce its dependence on fluctuating commodities prices) and lags in technology adoption and innovative management practices by its producers, particularly around increased resilience to climate change. The economic effects of the COVID-19 pandemic have compounded further the socio-economic vulnerabilities of these producers. However, Uruguay's livestock production system for beef and dairy products is one of the few existing global ecosystems based on natural grasslands. Uruguay has been working to mainstream climate-smart agri-food systems and production practices that support its international image of advancing clean, green, and responsible agriculture, generating safe products of high intrinsic quality, as well as respecting animal health and welfare and the environment.

20. **Prospects for expanding Uruguay's exports are positive, provided the country keeps abreast of more stringent market demands and in tune with evolving consumer preferences.** As countries roll back COVID-19 restrictions, foreign market demand for beef is becoming a bright opportunity, given that lower production and tighter exportable supplies in competitor countries are expected to limit the global availability of beef, while China and Korea (among others) have increasing demand. Current forecasts estimate global beef exports to reach 1.5 million metric tons (MT) in 2021, about a 16 percent increase compared with 2020[13]. However, Uruguay seeks to be a country not only offering a reliable seal of product quality, but also demonstrating that responsible processes and practices are followed along the value chain, in accordance with modern standards and preferences, meeting growing demands for social equity, inclusion, resiliency, and environmental sustainability[14].

21. **The World Bank Group has been engaged successfully in supporting Uruguay in its strategic journey toward a green and resilient agri-food sector.** The World Bank (WB) has forged a long-standing partnership with Uruguay related to enhancing traceability for agriculture goods. This work started with the Family Livestock Development Project in 2010 to create beef traceability through the National System for Livestock Information

[13] Foreign Agricultural Service – United States Department of Agriculture (July 2021).
[14] The National Meats Institute (*Instituto Nacional de Carnes,* INAC), has pioneered a Certification Program for beef for farms, transportation companies and slaughtering plants, which are audited and approved for INAC-certification of Animal Welfare. The certified beef labeled with a special logo must come from animals handled through the entire chain according to strict standards with guarantees of proper animal handling, for quality of the final product.

(SNIG), continued under the Sustainable Management of Climate Change and Natural Resources (DACC) Project, with the National System for Agricultural Information (SNIA) traceability of soils, pesticides, and key value-chains, like honey and rice. These systems have helped to build a foundation for the sustainability of Uruguayan agriculture and are being expanded to cover other key primary products/inputs and processes, to improve the country's image and enhance international competitiveness.

22. **The proposed Project would build on the DACC Project in Uruguay, taking advantage also of World Bank analytical work and academic research published in Uruguay.** DACC was originally approved in November 2011 (P124181) with a loan of US$49 million, and later expanded with an Additional Financing (AF) approved in November 2017 (P163444) of US$42 million (scheduled closing, November 16, 2021). DACC's main objective is to support efforts to promote farmer adoption of climate-smart agricultural and livestock practices, as well as improved natural resource management practices in the country. DACC has supported investments in mapping and spatial analysis tools, policies to enhance natural resource protection in the context of sustainable intensification, as well as supporting the development of SNIA, which contributed to on-farm investments for the adoption of climate resilient and sustainable practices on approximately 2.6 million hectares of land (over 5,130 family farms), thus contributing to increasing resilience to climate variability and protecting natural resources. Work under DACC has also helped to showcase Uruguay's ability to lead in natural resource management and climate mitigation and adaptation, as well as to identify the remaining weaknesses or emerging challenges that need to be overcome in the institutional and technological areas, and in the policy and regulatory framework. The proposed Project also builds on other World Bank analytical work, including the analysis under the 2018 work "Green growth: Towards a strategy for Uruguay" (P161012) and the 2016 "Water for Uruguay" programmatic approach (P146365), as well as research from the OPYPA, including "The Impact of investments in Cuenca Santa Lucia on Water quality"[15] and "Results and Learning from the Evaluation of Agricultural Policies in Uruguay[16]".

23. **Building on the existing strong partnership with Uruguay, the proposed Project will support strengthening the capacity of MGAP (and key relevant public agencies) to move the country's agri-food sector toward an ever-stronger climate-smart, agro-ecological production system.** A transition towards agro-ecological production requires strong data systems, so that agricultural decision-making is accessible to producers throughout the country (to be based in SNIA). While the basic interoperability stage in the SNIA has already been achieved, it is necessary to consolidate the system to evolve towards an adequate management of natural resources, as well as the construction of indicators that account for the environmental attributes to certify the differential natural origin of Uruguayan products. In addition, there are other areas identified as priority for the establishment of an agro-ecological production system and to strengthen Uruguay's position in the international arena, which are innovative in nature and have not yet been addressed. Each of these strategies requires careful data collection, aggregation for presentation, dissemination, and monitoring, which is challenging given that the requisite set of capacities are not fully developed in Uruguay. The proposed IBRD-funded operation will support actions within a larger framework (developed by MGAP) to increase climate resilience and adaptation, reduce emissions, support animal wellbeing and the transition to agro-ecological production, which are underpinned by laws and policies that establish responsibilities and propose actions for addressing these themes.

[15]https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/anuario-opypa-2020/estudios/impacto-potencial-convocatoria-cuenca-santa
[16]https://www.researchgate.net/publication/348310220_Resultados_y_aprendizajes_de_la_evaluacion_de_politicas_agropecuarias_en_Uruguay

C. Relevance to Higher Level Objectives

24. **The Project directly supports a key pillar of the Uruguay Country Partnership Framework (CPF) 2016-2020[17].** Due to the COVID-19 pandemic, the development of the subsequent Uruguay CPF was put on hold. The Project directly supports Pillar III, "bolstering Uruguay's continued integration into the global economy," specifically as it aims to boost production, productivity, and competitiveness of Uruguay's exports. The new CPF is being prepared, with a focus on climate change, social inclusion, and institutional strengthening. The proposed Project will concentrate on these three pillars.

25. **The Project supports institutional strengthening to help bridge important institutional capacity gaps.** Uruguay lags some peers in important dimensions in terms of the development of key robust institutions and policies that: (a) ensure that income gains are sustained over time; (b) are less vulnerable to volatility and reversals; and (c) are distributed to balance equity with incentives conducive to dynamic and resilient economic performance. In Uruguay, the effectiveness of the state and the quality of public policies are undermined by the weak enforcement of laws and regulations, limited coordination among government agencies, and rigid human resource management practices in public administration. The proposed Project will focus on building the institutional capacity in key agriculture-sector institutions for better agriculture-sector data and to implement key public sector laws (see Table A3.1 in Annex 3). These will contribute to better enforcement of public policy, increased climate resilience and adaptation and greater competitiveness in global markets.

26. **The Project also provides critical investments to support the mitigation and adaptation strategies under the National Plan for Climate Change (PNCC)** (approved November 3, 2017), a long-term strategic instrument to guide the transformations that Uruguay must undertake to face the challenges of climate change and variability. It also supports key sector strategies and policies related to climate change, agriculture risk management, animal health and a transition towards agroecology. Moreover, the Project will contribute to the National Strategy for Bioeconomy through investments in effluent management to protect watershed resources in the Santa Lucia Basin, which supplies Montevideo with potable water. Through targeted support to female beneficiaries, it will also support MGAPs' 2019 gender and climate change strategy, which established specific gender actions. Finally, the data contributions to insurance instruments aim to continue the tradition of piloting innovative approaches in Uruguay to later export them across the Latin America region and across the world, as was done, for example, with the traceability standards developed under the predecessors of this Project.

27. **The Project is consistent with the World Bank's "Development and Climate Change Report".[18]** Developing countries will bear the brunt of the effects of climate change, even as they strive to overcome poverty and advance economic growth. For these countries, climate change threatens to deepen vulnerabilities, erode hard-won gains, and seriously undermine prospects for development, thus making it more difficult to attain the Millennium Development Goals and ensure a safe and sustainable future. The proposed Project includes actions consistent with the main areas highlighted in the Report, among others: protecting biodiversity and ecosystems, managing land and water resources, managing physical, financial, and social risks, integrate mitigation and adaptation into country's climate-smart development, and accelerating innovation and technology diffusion.

[17] The CPF, Report No. 97063-UY, was discussed by the Executive Directors on June 14, 2016 and was validated by its Performance and Learning Review dated February 27th, 2018.
[18] 32nd World Development Report. The World Bank, 2010.

28. **Similarly, the Project is consistent with the World Bank's Climate Change Action Plan, 2021-2025.**[19] The Climate Change Action Plan 2021–2025 aims to advance the climate change aspects of the World Bank's Green, Resilient, and Inclusive Development (GRID) approach,[20] which pursues poverty eradication and shared prosperity with a sustainability lens. The World Bank's adoption of this integrated longer-horizon strategy intends to repair the structural damage caused by COVID-19, accelerate climate-change mitigation and adaption, and underpin a strong and durable economic and social recovery, with the goal of "building back greener." The Project aligns with this GRID strategy by providing support toward resilience (climate change adaptation and mitigation), inclusion (creating sustainable new jobs), sustainability (investments in circular economy) and equity (addressing structural inequalities deepened by COVID-19 and rebuilding social capital). The Project is aiming to accelerate digital transformation by main public and private institutions, agri-businesses, and productive units for a long-term resilient recovery. Finally, the Project is also consistent with World Bank Group's climate-change commitments, particularly through support to both adaptation and mitigation measures, expecting to generate co-benefits through its technical assistance and information and contribute to the Bank's Climate Change Action Plan goals.

29. **The Project is aligned with the World Bank Group's twin goals of ending extreme poverty and sustainably boosting shared prosperity.** This is accomplished through the Project's focus on key investments contributing to enhancing efficiency in productive sectors where the country has international competitive advantage, further enhancing productivity, competitiveness, and resiliency, and improving economic opportunities of small- and medium-agricultural producers, contributing to mitigation and adaptation to climate change and environmental sustainability. In addition, the Project is in line with the objectives of the World Bank's Gender Strategy (FY16-FY23): to improve human endowments (access to agriculture knowledge) and remove barriers to women's ownership and control of assets (access to services and inputs, and capacity to address climate change).

II. PROJECT DESCRIPTION

A. Project Development Objective

30. **The Project Development Objectives (PDO) are to: (i) strengthen agricultural public systems and rural producers to increase climate change adaptation and mitigation actions and promote agro-ecological production; and (ii) respond effectively in case of an Eligible Crisis or Emergency.**

Table 1: PDO Level Indicators.

PDO Theme	PDO Indicator
Climate Change	▪ Producers using climate change information, data services and tools supported by the Project (number), disaggregated by gender. ▪ Collaboration across technical entities in the agriculture sector improved (number of Memoranda of Understanding, or MOUs).
Agro-ecological Transition	▪ Land area under sustainable landscape management practices (CRI) (ha). ▪ Farmers adopting improved agricultural technology, disaggregated by gender (CRI) (number).

[19] World Bank Group, Climate Change Action Plan, 2021-2025. Supporting Green, Resilient, and Inclusive Development. The World Bank, 2021.
[20] From COVID-19 Crisis Response to Resilient Recovery. Saving Lives and Livelihoods while Supporting Green, Resilient, and Inclusive Development (GRID). The World Bank Group Paper, April 9, 2021.

B. Project Description (see further details in Annex 2)

31. **Component 1: Strengthening Decision Support Systems for Climate Resilience** (IBRD US$21.2 million, GoU US$3 million, Local beneficiaries US$6 million). The component will contribute to the GoU's broader efforts to achieve sustainable agricultural production, increased climate change resilience and improved agriculture risk management. The component will consolidate and reinforce MGAP's existing digital platforms and develop additional digital tools for better public and private sector decision making. The component will finance goods, training, operational costs, grants, consulting, and non-consulting services for the implementation of six activities (as described below), each of which will be under the technical supervision of different technical units of MGAP, building on their respective competences and experience. Financing will contribute to improve climate resilience and generate mitigation and adaptation co-benefits, as well as contribute to narrowing the gender gap in relation to access to agriculture and climate-related information.

a) **Strengthening and expanding agriculture traceability systems.** Provision of support for: (a) the strengthening and integration of MGAP's existing digital traceability systems, including the design and establishment of a system to register and trace veterinary and phytosanitary product sales and control the disposal of product packaging; and (b) the development of a national-level system for tagging and registration of domestic companion animals (pets) in RENAC. This activity, under the technical leadership of MGAP's National Agriculture Information System (SNIA), will support the strengthening and expansion of the existing digital traceability systems to create the basis for an agro-ecological transition, thus contributing to enhance environmental sustainability and the adoption of new technologies which are essential for increased competitiveness, food quality monitoring and for mitigation and adaptation to climate change.
b) **Management and monitoring of agricultural chemicals.** Provision of support for scaling up MGAP's Phytosanitary Applications Management and Monitoring System for phytosanitary products. The Directorate-General of Agriculture Services (DGSA) will be responsible for the implementation of this activity in collaboration with the SNIA team.
c) **Strengthening the Natural Resources Management System.** Provision of support for the development of a National Resources Management System (NRMS), including the provision of financing for completing the soil mapping for the entire Borrower's cultivated territory at the same scale, and for enhancing remote sensing capacity to increase the Borrower's ability to remotely monitor the use of natural resources and adherence to the mandated soil use and management plans. DGRN will provide technical leadership for this activity. It will specifically invest in the development of the NRMS to support information tracking related to natural resource management and generate aggregate information for improved natural resource management.
d) **Enhancing agriculture risk management mechanisms and developing risk transfer solutions.** Provision of support for: (a) strengthening OPYPA's capacity to generate and systematize information related to the impact of extreme climatic events on the agricultural sector; (b) carrying out of a pilot to collect, validate and disseminate agricultural actuarial data to improve the design of selected agriculture insurance products, new risk transfer instruments and excess of loss reinsurance protection; and (c) developing and implementing a governance mechanism among public sector institutions to improve their capacity for agricultural risk management through the financing of vulnerability and risk assessments, the elaboration of an integrated agricultural risk management plan and a communication strategy for public awareness and advocacy. The activity will be under technical leadership of OPYPA in collaboration with SNIA and promote the adoption of risk prevention, transferring, and coping strategies by strengthening data systems for use by agricultural sector insurance mechanisms and foster the adoption of new technologies leading to greater resilience and economic sustainability of productive activities.

e) **Generating environmental and agricultural indicators and tracking system.** Provision of support for strengthening OPYPA's capacity to track the Borrower's contributions to the Paris Agreement through Environmental Accounting, generation of a National Green House Gas (GHG) Inventory and the tracking of indicators towards reporting requirements for contributions in both GHG mitigation and adaptation, including the carrying out of an economic analysis and impact evaluation of MGAP's programs.
f) **Improving female farmers' access to decision support systems.** Provision of training and capacity building activities to improve digital literacy among female producers, including a pilot for the provision of digital literacy support and accompanying devices, to increase their access to agricultural information. This activity will be under the technical leadership of MGAP's Gender Unit, in coordination with the SNIA team.

34. **Component 2: Supporting a Transition to Agro-ecological Production** (IBRD US$11.6 million, Government US$8 million). The component will contribute to MGAP's broader efforts to transition its agri-food sector towards one based on agro-ecological principles, increasing competitiveness, employing a "One Health" approach, and contributing to fundamental aspects of climate change resilience and mitigation in the sector. Through four subcomponents, the component will finance: (a) consulting and non-consulting services to support key, strategic institutional strengthening and policy development activities in support of Uruguay's agro-ecological transition; (b) matching grants to finance goods, small works, services, training, and technical assistance for the implementation of agroecology subprojects that advance climate mitigation and adaptation actions; (c) support of the agro-ecological management in the Santa Lucia Watershed for improved stewardship of this important watershed; and (d) the design of a model for the certification of agro-ecological production. These investments will capitalize on the public goods under Component 1, helping to establish commercial branding for Uruguayan agriculture around principles of an agro-ecological production and creating international recognition for Uruguay's sustainable and green production principles and practices in accordance with international market demands.

35. This component will emphasize support to female farmers for an agro-ecological transition by addressing the specific barriers they face in accessing inputs/resources and adequate technical assistance in the sector. With the goal of increasing female-led agribusiness resilience and the potential for leveraging some women-specific product branding to access higher-value and specialized markets, the component will: (a) support the design/development of information outreach in line with information needs of female and male farmers to ensure they are aware of Project opportunities; adopt measures in the selection processes and eligibility criteria giving special priority to women-led farms, and (b) tailor capacity building activities to cover knowledge needs of female farmers and address potential barriers for their participation (See Annex 5 for more details).

36. **Subcomponent 2.1: Development of a strategy to define the territorial transition to agro-ecology -** will develop an agroecology strategy for the agriculture sector to guide farmers to adopt practices and technologies consistent with agroecological production, including the definition of the parameters of an agroecological transition on-farm and with emphasis on female producers. The strategy will generate a list of defined technologies to be included for the activities to be supported for the on-farm agro-ecological transition and for the support of watershed management (subcomponents 2.3 and 2.4). Technologies will include effluent management technologies, soil rotation strategies, monitored use of biofertilizers, biopesticides management and incorporation of production management technologies, among others (see Annex 6). An agro-ecological Transition Committee (CTA), supported by the Project, will serve as a coordination body to innovate, and facilitate the implementation of the transversality of agroecology as a State policy, allowing close collaboration and communication between all institutions directly involved.

37. **Subcomponent 2.2: Strengthening the National Institute for Animal Welfare (INBA) –** will provide support to INBA to, *inter alia*: (a) comply with the requirements of Law No. 18.471 and develop a National Animal Welfare Strategy to support the implementation and monitoring of Law No. 18.471; and (b) undertake a diagnostic of animal welfare in animal species prioritized by INBA. The Project will finance goods, consulting and non-consulting services, training, and operational costs to contribute to increasing the institutional capacity of INBA. The main objective is to support One Health aspects of Uruguay's agro-ecological transition through selective institutional strengthening and policy development activities. This aligns with the principle that protecting animal health and welfare contributes also to human health, safety, and food security, while contributing directly to improved economic returns for the sector, notably from reduced animal losses through mortality and morbidity. It also links to Uruguay's commitments to produce high-quality products with exemplary production processes and practices (including animal welfare considerations).

38. **Subcomponent 2.3: Support to develop and implement a farm-level model for agroecological production -** will provide financing for: (a) carrying out Agroecological Subprojects; and (b) developing a national certification model for agroecological production. The purpose of this subcomponent is to demonstrate how a farm-level transition to agro-ecological production can be effectively implemented in key areas of Uruguay. The subcomponent will include the following sets of interrelated activities under the technical supervision of Directorate-General of Rural Development (DGDR) of MGAP. It will support selected producers, producer groups, and rural associations to formulate and implement agro-ecological subprojects, with the main goal of demonstrating the practical application of the agro-ecological transition technologies defined in the INIA-designed strategy for beef, dairy, fruit and horticulture and agriculture. The subcomponent will train approximately 100 extensionists and leverage 20 Territorial Agents for Rural Development to link producer organizations with technical assistance providers and support them to apply the packages of technology promoted in the INIA-designed strategy. Subprojects approved by an Evaluation Committee will receive matching grants (up to 75 percent of total investment cost) to partially finance goods, works, services and operational expenses, as well as technical assistance on top of the matching grant. A total of 140 subprojects will support 700 farmers with on-farm investments to transition toward agro-ecological production. Approximately 60 percent of on-farm investments will be with cattle farmers; the remaining will be divided between dairy farmers and fruit producers. (see Annex 2). The DGDR, working together with INIA, will select between five to ten subprojects as demonstration sites for showcasing the transition to agro-ecological production and disseminate the applicable technologies.

39. The subcomponent will also help develop a plan of action and build capacity to advance work towards the definition of a national certification model for agro-ecological production. The Directorate-General of Farms (DIGEGRA) will provide technical support to develop processes for registering and certifying "agro-ecological" products. The registration and certification processes will take advantage of new tools developed under other components to aggregate data, with a focus on tracking bio-products including bio-pesticides and bio-fertilizers for the development of the branding.

40. **Subcomponent 2.4: Support for agro-ecological watershed management in Santa Lucia Watershed --** will provide financing for carrying out Dairy Producer Subprojects on dairy farms in the Cuenca Santa Lucía to incorporate on-farm technologies for manure management and reduce effluent run-off to the watershed. The objective of this subcomponent is to contribute to improved water quality in the Santa Lucia Watershed (*Cuenca Santa Lucia*) through manure management techniques and technologies promoted by the INIA-designed Agro-ecological Strategy (subcomponent 2.1). The main benefits of the investments under this subcomponent will not be at the level of the individual farms; rather, it will be the improved water quality within the entire Santa Lucia watershed (which supplies potable water for most of Montevideo's population, or about 1 million people). Similar

investments under the DACC Project in this watershed have proven their ability to reduce phosphorous run-off and drastically reducing eutrophication.[21]

41. The subcomponent will target about 200 dairy producers in the *Cuenca Santa Lucia* watershed and partially finance individual effluent management plans to achieve on-farm circular economy through nutrient cycling. This subcomponent will be under the technical leadership of DGRN in collaboration with the Ministry of Environment and will be carried out through subsidiary agreements with the National Milk Institute[22] (INALE) and the National Cooperative of Milk Producers[23] (CONAPROLE). The support provided by this subcomponent will cover 80 percent of the investment costs for each farm, up to a limit of US$16,000 per farm; the farmers will be responsible for the remaining 20 percent of the costs of implementing the individual on-farm plans, including operational and maintenance costs. These producers are targeted given: (a) the considerable risks that they pose for contaminating water courses with livestock effluent run-off, making them a critical part of efforts to improve the agroecology and climate change resilience of the *Cuenca Santa Lucia*; (b) their smaller herd size (fewer than 300 cows); and (c) limited ability to finance upfront investments in effluent management improvements, relative to other farms in the watershed.

42. **Component 3: Project Management (IBRD US$2.7 million).** The component will provide support for overall Project management, including for: (a) the execution of fiduciary management, procurement, planning, monitoring and evaluation, training, legal and environment and social standards related activities and the carrying out of Project audits; (b) carrying out of a baseline assessment, a mid-term evaluation and an end-line assessment to examine the impact of the Project; and (c) overall implementation and monitoring of gender-related activities. The component will leverage the existing Project Management Unit (PMU) within the MGAP (officially called *Unidad de Gestión de Proyectos*, or UGP in Spanish) and complement Uruguay's strong public sector procurement, labor, legal, and regulatory frameworks. This Component will also examine differential impacts for female and male beneficiaries; the gender unit of MGAP will ensure implementation and monitoring of gender-related activities.

43. Component 4: Contingent Emergency Response Component - CERC (US$0 million). This component will provide immediate response to an Eligible Crisis or Emergency, as needed, and includes a contingent financing mechanism that would allow the Borrower to rapidly access Bank financing in case of a future eligible crisis or emergency.

Key Considerations in the Project Design

44. **Ex-ante Greenhouse Gas (GHG) Accounting.** To estimate the GHG impact of the agricultural subprojects, the analysis applied the World Bank approved Ex-ante carbon-balance tool (Ex-Act). The analysis measured the potential GHG impact generated from the agroecology demonstration subprojects and investments in manure management technologies in dairy farms. The results indicate that over the Project's 20-year duration, it constitutes a net carbon sink of around 1.12 million tCO_2-eq. The annual carbon sink is estimated at 56,061 tCO_2-eq or around 5.4 tons of tCO_2-eq per hectare. A detailed GHG Accounting is available in the Project files.

45. **Mobilizing Financing for Development (MFD).** The Project will leverage Private Capital through multiple

[21] *www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/anuario-opypa-2020/estudios/impacto-potencial-convocatoria-cuenca-santa*

[22] INALE was established in 2007 to articulate the public-private sectors and develop the dairy sector, advising the government on dairy policy and planning the development of dairy sector.

[23] CONAPROLE was created in 1935 and is the largest private firm and exporter in Uruguay. It is owned by around 2,000 small and medium dairy farmers, supplying milk to about 60 percent of Montevideo's population and an array of dairy products for the national and international markets.

Project activities. Under Component 1, the Project will help to promote a weather index insurance product that will cover 300,000 ha and benefit at least 200 producers annually, with a total net goal of 250 producers over the life of the Project (some beneficiaries may be benefiting over several years), leveraging a total of US$6 million in private capital from the producers. The Project will finance a total of 900 subprojects – 700 in agro-ecological transition and 200 in the Santa Lucia watershed. Family farmers will contribute at least 20 percent, while medium farmers will contribute at least 50 percent of the subproject cost, for a total estimated investment of at least US$1.8 million. Finally, the Project expects that the demonstration farms will facilitate 500 additional producer-own investments in agro-ecological transition, equating to an investment of approximately US$ 0.5 million.

46. **Gender.** The Project aims to narrow two main gender gaps in the sector in relation to access to agricultural information (women represent only 28 percent of total users of existing information systems) and to access technical assistance in the sector and climate-related knowledge.[24] Despite improvements in reducing the digital divide, women in rural areas tend to face barriers to accessing and using ICTs. In addition, women have less access to inputs/resources in the sector and existing technical assistance do not adequately meet their demands and needs[25]. To address these gaps and underlying constraints, the Project will use MGAP information systems and address specific demands of female groups to improve product traceability/natural resources management and provide targeted support to women-led subprojects and identify women-led subprojects as demonstration sites. To monitor the Project's contribution in narrowing identified gaps, the results framework includes specific indicators for monitoring women accessing data services and tools provided by the Project, and female farmers adopting improved agricultural technology (Results Framework and details in Annex 5).

47. **Citizen Engagement.** A wide range of stakeholders were consulted during Project preparation (through a participatory process) to build a diagnosis; their feedback has been used to design the Project components. During implementation, the Project will strengthen the social compact with users of global public goods being supported under Component 1, including women, and will seek the feedback of such users (with gender disaggregated data) via satisfaction surveys, and incorporate said feedback to improve public goods delivery. Likewise, citizen engagement events with producers (targeting women and youth) will be carried out, providing avenues for two-way interactions to develop consensus and gain insights from producers in terms of their needs and aspirations for specific activities. The Project's stakeholder engagement process, as defined in the draft Stakeholder Engagement Plan (SEP), lays out a continuous consultation and communication process with directly affected and other interested stakeholders.[26] The Project will prioritize the views of producers, communities, and civil society to ensure adaptive learning, leading to changes that will benefit the poor and more vulnerable, including women and youth. Satisfaction surveys will provide further feedback on the effectiveness of this approach. The Project has multiple indicators to track citizen feedback, including by measuring user satisfaction with the global public goods improvements supported by Component 1. User satisfaction survey results will be shared and discussed with users as part of the social compact process and stakeholder engagement activities.

C. Project Beneficiaries

48. The Project is expected to reach approximately 17,400 direct beneficiaries, approximately 40 percent of whom will be women.[27] The Project will benefit over 12,000 individuals with access to improved information tools,

[24] In 2014, women were only 22 percent of those benefitting from subsidies and technical assistance to improve agricultural production
[25] FAO and MGAP, 2021.
[26] The SEP was disclosed on INAPA's website *https://www.inapa.gob.do/index.php/proyectos/category/66-mejoramiento-de-los-servicios-de-agua-potable-y-aguas-residuales-en-los-municipios-de-moca-y-gaspar-hernandez-provincia-espaillat*, and by the Bank on June 19, 2020.
[27] This assumes a family size of four individuals and assumes that each subproject / insurance intervention benefits four household members (two men, two women).

policies, animal health procedures and marketing/branding to make the sector more competitive. This includes 2,000 women who will receive tablets and technical assistance to improve their digital literacy. In addition, at least 250 producers will receive direct Project support for improved weather index insurance instruments. Under Component 2, 900 subprojects will be executed on individual farms – 200 for effluent management in *Cuenca Santa Lucia* and 700 individual producers through 140 subprojects with demonstration of additional technologies for agro-ecological transitions. In addition, it is expected that approximately 500 other farmers will adopt new technologies with support through demonstration sites and Project technical assistance. The subprojects in *Cuenca Santa Lucia* will have some on-farm benefits for individual farmers, but their largest benefits come from their contribution to public goods – for investments in *Cuenca Santa Lucia* towards improved water quality and investments in agroecology as demonstrations for other farmers. The Project will also indirectly benefit consumers with safer products (at more internationally competitive prices), as well as the population at large that will benefit from enhanced water quality and more sustainable environmental conditions.

49. The Project will benefit the overall sector by strengthening systems in MGAP, INBA and INIA, as well as supporting improvements in CONAPROLE, INALE and the Ministry of the Environment. At the same time, the investments in resilience will help reduce the sector's vulnerability to climate change and agroecology and preserve natural resources. Similarly, the Project will benefit private sector businesses at large, by contributing to reducing risks (by implementation of insurance programs) and by the generation and diffusion of new technologies and practices increasing productivity and climate change resiliency. Finally, it will provide global benefits by increasing Uruguay's ability to produce low-carbon intensity products and increase capacity to track contributions towards the NDCs. It will also directly strengthen key areas of MGAP, INBA, INIA and others with additional capacity and tools for better policy and decision making (see Annex 3 for full list of institutions strengthened). Internationally, the Project will contribute to populations in countries importing Uruguay's agricultural products (beef, lamb, dairy products, vegetables, etc.) at competitive prices and complying with higher level of certification in terms of quality of products and reduced carbon emissions from processes involved.

D. Project Costs and Financing

Table 2. Total Cost of Project

Components	IBRD Loan	Counterpart Financing	Total costs
	(US$ million)		
1: Strengthening Decision Support Systems for Climate Resilience	21.2	9.0	30.2
2: Supporting a Transition to Agro-ecological Production	11.6	9.7	21.3
3: Project Management	2.7	--	2.7
4: CERC	---	---	0.0
Total:	**35.5**	**18.7**	**54.2**

E. Results Chain

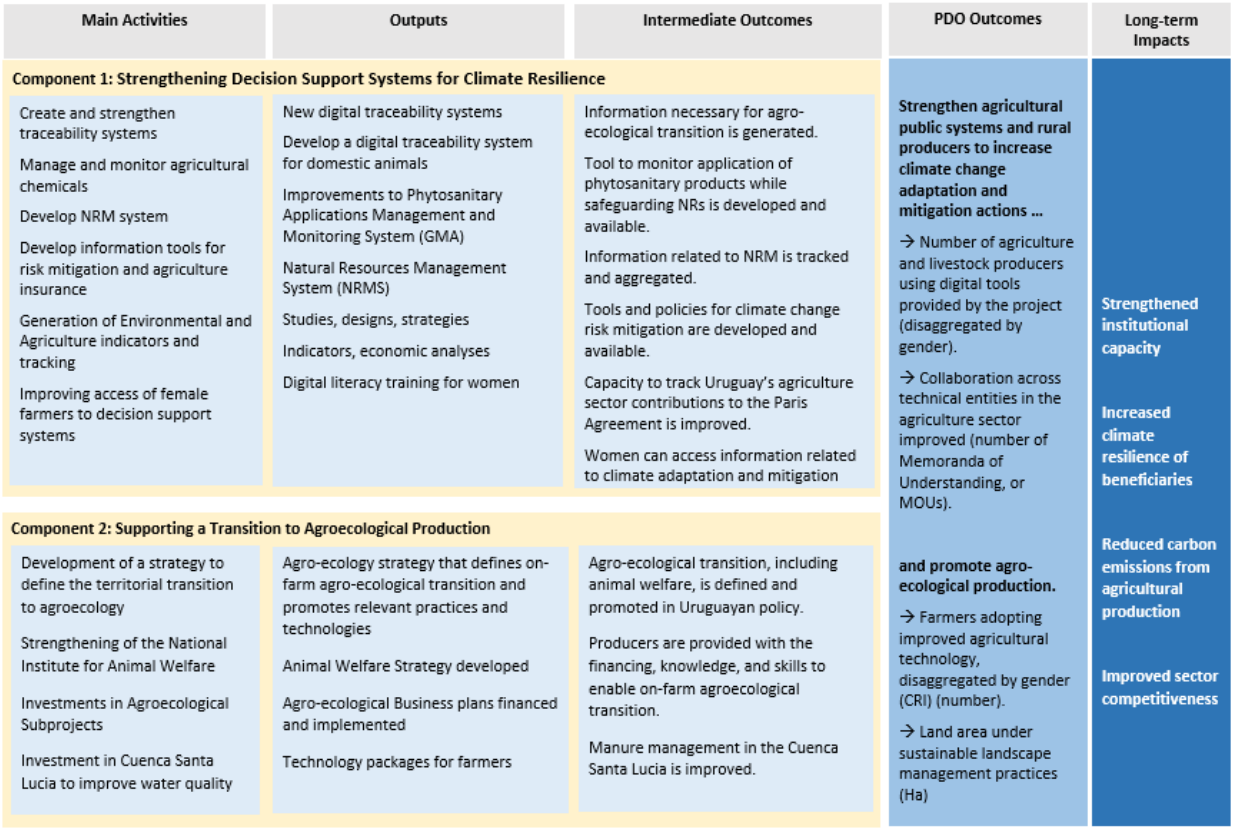


Table 3. Results Chain assumptions and measures to reduce risks

Beneficiaries are incentivized to adopt new agricultural technologies.	The project will implement a communications and stakeholder engagement strategy for producers.
Subproject performance is not affected by climate change and weather variability.	The project will support measures to mitigate climate risks and remain flexible to respond to potential climate-related impacts.
Technical entities in the Agriculture sector participate in project implementation	MGAP will sign MOUs with technical partners and coordinate closely with key sector actors.
There is continued political will to implement the project.	The implementing agency and task team will regularly report to high-level authorities to highlight project impacts, achievements, and relevance.

F. Rationale for Bank Involvement and Role of Partners

50. **The Project proposes to increase the capacity of MGAP and other sector actors to support priority policies while strengthening the relationship between the World Bank and Uruguay to demonstrate innovation in low-carbon, environmentally smart food production to the rest of the world.** The Project will build on the WB's long history in Uruguay while providing new capacities to respond to the evolving threat of climate change in the sector. The foundational work by previous Projects is now ready to be consolidated and used for institutional strengthening and the previous analytical work on green growth positions Uruguay to bring "green marketing" to scale. The World Bank will help Uruguay to foster partnerships across institutions, academic partners and other county governments to further Uruguay's position as a global leader in innovative climate-resilient policies.

51. **The WB brings regional leadership in the areas of agriculture and natural resource management in the**

context of climate change. The World Bank is supporting governments across the region for climate adaptation in agriculture under the Platform for Climate Action in Agriculture in Latin America and the Caribbean (PLACA), and Uruguay holds its rotative Presidency during the 2021-2022 period. The WB also coordinates academic and bilateral partnerships to elevate the quality of Uruguay's climate policies and programs to be at the forefront of global knowledge. It also leverages its global presence to showcase the Uruguay example as one of the leaders in climate-resilient agricultural production. As Uruguay defines a transition towards agro-ecological production, the WB will help position Uruguay as one of the few countries taking the lead in agro-ecological production.

G. Lessons Learned and Reflected in the Project Design

52. **Digital traceability systems can be leveraged to increase agricultural competitiveness and sustainability.** Since the construction of the SNIG system, Uruguay has been a global leader in cattle traceability systems built around strong phytosanitary systems. Building on the experience under the DACC Project, MGAP expanded traceability systems to include digital traceability for rice, honey, soil use and others. The Ministry has seen how critical traceability is not just for phytosanitary monitoring and control, but also for climate resilience, natural resource management, animal welfare and accessing differentiated agricultural markets. It has also shown to be critical for: (a) building data bases to support climate resilient systems and monitor progress towards important international goals; (b) enforcing national laws and policies; and (c) boosting the profile of Uruguay's production in international markets. The Project will elevate the importance of traceability systems, to strengthen the soil traceability system, scale the agrochemical traceability system, and build a new pet traceability system.

53. **Transitioning to an agro-ecological production requires research, piloting, coordination, and well-aligned incentives.** Within the last decade, terminology including "sustainable intensification", "climate-smart agriculture", "circular production" and, more recently, "agroecology" have all described a type of sustainable production of agriculture. Lessons learned from countries that have been successful in changing their production models (e.g., Ireland), have shown that to transition to a more sustainable model, foundation research, intensive piloting and sector-wide coordination are needed. Moreover, Ireland exemplifies how aligning sustainability goals with private sector incentives can promote a more complete sector-wide transition. The proposed Project will look to the example of the Irish sustainable board Origin Green[28] and leverage the Project's traceability systems to help align an agro-ecological transition with improved market opportunities for family farmers.

54. **Individual producers benefit from support from trusted local entities for executing subprojects.** Lessons from agri-food systems projects across the LAC region, including from the DACC Project, demonstrate how family producers need technical, financial and implementation support to execute subprojects over the longer term, to ensure outcomes that are meaningful and sustainable. Having trusted local entities like CONAPROLE and INALE accompany the implementation of the subprojects for farm water effluents treatment plans in Santa Lucia Basin helps to build trust with the famers and leverages the deep technical expertise of both institutions.

55. Collaboration across technical entities in the agriculture sector is key for broad institutional capacity building. There are many technical units within MGAP, each with their own specialized area of expertise, knowledge, data, staff, and presence on-the-ground with farmers. Additionally, there are other key institutions working in agriculture. Being able to collaborate across MGAP units is critical for leveraging the depth of capacity of the Ministry and working with multiple units is critical for strengthening the technical units of the Ministry. Work with other institutions outside of MGAP (for example, Ministry of Environment, INALE, INIA, CONAPROLE, etc.) helps to strengthen the entire agriculture sector. Some of these relationships were leveraged under the DACC

[28] https://www.origingreen.ie/

Project, and this Project will further expand to incorporate and strengthen more players across the sector.

56. **Innovative digital tools can be leveraged to better incorporate female farmers.** Female-led farms are among the minority of farms in Uruguay and ensuring that female farmers are incorporated into Project activities takes concerted efforts with Project design. While the DACC Project disaggregated indicators by gender, it did not specifically target female beneficiaries. Under the proposed Project, the activities propose to look at all the people benefiting from the investments, not just the head of household. In addition, the gender gap analysis found that female farmers are slow to adopt technology for climate adaptation because they lack the relevant information. The Project will mainstream best practices from the popular national program "Plan Ceibal" that distributes laptops to children to provide digital literacy training and accompanying laptops/notebooks to female farmers.

III. IMPLEMENTATION

A. Institutional and Implementation Arrangements

57. **The Project will be executed by the Project Management Unit (PMU) within MGAP.** MGAP is the main public institution in the sector, comprising several executive and technical units with diverse competencies that together define the main strategic guidelines and agricultural policies as well as coordinate and monitor their implementation in support of the development of the sector. The existing PMU is the unit within MGAP that executes all externally financed projects and has successfully executed the DACC Project. The PMU also executes the Reducing Emissions from Deforestation and Forest Degradation (REDD) II Project (P151978) as well as projects from other external partners. The PMU will coordinate and oversee all activities under the components, coordinate all units within MGAP and supervise other agencies, such as INBA, INIA, CONAPROLE and INALE. The PMU is staffed by highly skilled individuals in each of the following areas: overall Project management, financial management (FM), environmental and social risk management, procurement, monitoring and evaluation, training, and communications. Each area coordinator manages a team of sector specialists that supports the work. Staffing has been stable over the years, and PMU staff have benefitted from numerous World Bank trainings and workshops in procurement, FM, monitoring and evaluating sustainability, environmental and social risk management, and technical areas.

58. **The technical units of MGAP will lead various parts of the Project and contribute to the technical areas of the Project.** Most of these technical units were also involved in the execution of the DACC Project. The technical units inside MGAP involved in the Project are: DGRN, DGSA, DGDR, Directorate-General of Forestry (DGF), Directorate-General of Livestock Services (DGSG), Directorate-General of Biosecurity and Food Safety (DGBIA), DIGEGRA and the Directorate-General of Secretaries (DGS), which contains OPYPA, the PMU and information systems services. A description of these technical units is included in Annex 3. Beyond MGAP, multiple public or private-public institutions are involved in the implementation of specific agriculture policies, among others: The National Meat Institute (INAC); the National Seeds Institute; the National Institute of Viticulture (INAVI); the National Agricultural Research Institute (INIA); and the Agricultural Plan Institute. INIA and the Faculty of Agronomy of the public University of the Republic (UDELAR) are the main actors in the academic sector, responsible for generating knowledge and technologies, specifically around priority areas of the Ministry, such as climate change adaptation and mitigation for the different production systems.

59. **The implementation of subprojects in the Santa Lucia Basin under Subcomponent 2.4 will be supported by CONAPROLE and INALE**. For this purpose, the PMU will sign Subsidiary Agreements with CONAPROLE and INALE for their technical and fiduciary responsibilities in the preparation, procurement and payment of goods and overall

monitoring of the subprojects, under overall PMU supervision. CONAPROLE will implement the procurement activities un the subprojects identified by producers through PROLESA (created and owned by CONAPROLE), which has the specific role of providing goods and services to the producers that are members of CONAPROLE.

B. Results Monitoring and Evaluation Arrangements

60. **The PMU hosts a monitoring and evaluation (M&E) unit.** This unit tracks the indicators of each project managed by the PMU. This unit will be responsible for leading Project M&E, including beneficiary satisfaction surveys. The staff responsible for the coordination of the unit has been with the unit since 2012, during which time, he has undergone multiple M&E trainings, including two full weeks of international training hosted by the WB, one in Mexico and the other in Brazil. The monitoring unit corresponds with each of the technical units within MGAP to regularly collect data on indicator progress.

61. **In addition, the PMU works closely with the economic analysis unit at OPYPA to design and undertake impact assessments on individual interventions.** During the implementation of the DACC Project, OPYPA conducted impact assessments on every call for proposals executed under the "Territorial Interventions for CSA and livestock" and published these results in their Annual Reports. The Project will invest in a dedicated information system to facilitate OPYPA's project evaluations. In addition, OPYPA has prepared a specific workstream for the M&E of the Project. Among the planned analyses are: (a) an evaluation of the investments in Cuenca Santa Lucia; (b) a model to evaluate ex-ante ecosystem services policies; (c) updating beneficiary databases for better tracking; and (d) gender analysis to model and examine the impact of each of the interventions on women and men. OPYPA helps to strengthen the PMU's M&E unit on a continual basis.

C. Sustainability

62. **The Project will strengthen agriculture sector institutions to better implement key policies across the sector.** Project investments will strengthen MGAP and many of its technical units, that will benefit from Project interventions to undertake diagnostics, strengthen data and information systems, increase mapping capacity, bolster remote sensing capacity, support national indicator monitoring and boost Project evaluation expertise. By supporting the creation of widely available online systems related to natural resource sustainability, the Project will strengthen the MGAP's and other stakeholder's abilities to manage sustainably manage future agro-ecological production agro-ecological. The SNIG became operational in 2004 through World Bank support to the recovery of Uruguay from the Foot and Mouth Disease epidemic[29] and now serves as the beacon of agriculture traceability in the region. As such, Uruguay has demonstrated its commitment to ensure the sustainability of Project-supported systems.

63. **The proposed transition towards agro-ecological production aims to increase the sustainability of the agriculture sector vis-à-vis natural resource management.** A national strategy for an agro-ecological transition will be developed to guide the sector towards more sustainable production, with a focus on GHG mitigation and climate adaptation for resilience. The strategy will impact sustainability at the public policy and decision-making levels by laying out how the public sector can foster private investment in agro-ecological production. It will impact producers through targeted investments for 600 farmers in, for example, effluent management technologies and soil rotation strategies to demonstrate on-farm agro-ecological transition with stricter environmental conditions.

[29] https://blogs.worldbank.org/voices/knowing-your-steak-s-origin-and-impact-environment-it-s-possible

64. **The Project will leverage market mechanisms to make an agro-ecological transition an attractive value proposition for producers.** Investments through Component 3 are intended to develop branding opportunities that will open opportunities in higher value, differentiated product markets, thereby making adoption of these technologies more attractive to producers. In comparator countries, market-drive mechanisms have aligned incentives for producers to sustain improved productivity practices to enhance market opportunities. The agro-ecological branding and labeling will also incorporate gender as a key factor of agro-ecological production, thereby highlighting women's role in the sector.

65. **The Project will contribute to maintain Uruguay's push toward greater productivity and competitiveness.** At the level of productive farms, rural enterprises and exporters, the Project will help increase competitiveness and access to higher value markets, as well as enhanced resiliency to climate change trends, therefore increasing level of profitability and financial sustainability. This will be a continuation of Uruguay's approach adopted in the last decades, which will accelerate and evolve in the future, therefore, further contributing to long-term sustainability.

66. **The Bank proposes to rely, for the first time under the ESF, on the institutional and legal framework of the Borrower to manage the labor risks of the project.** This proposal is grounded on the recognition that Uruguay has a robust framework, including implementation capacity and track record, to manage the labor risks of the proposed Project. The Project will be the first to fulfil the Bank's commitment to rely, where possible and appropriate, on the use and development of the Borrower's frameworks to avoid unnecessary duplication of effort, build national capacity and achieve development outcomes under that are materially consistent with the objectives of the Environmental and Social Framework. A strong labor framework is also key to the transition to more agro-ecological branding and labelling envisaged under the Project.

IV. PROJECT APPRAISAL SUMMARY

A. Economic and Financial Analysis (see Annex 4)

67. The economic analysis uses a cash flow model over a 20-year period that includes all Project investment and maintenance costs, as well as the incremental net revenues derived from the financial models. The total investments are estimated to be US$52.5 million (IBRD financing and counterpart funding) over the five years of implementation. The yearly maintenance and operation costs after Project closure are estimated to be equivalent to US$1 million. The overall program economic cash flow and corresponding economic internal rate of return (EIRR) have been calculated by aggregating the net incremental benefits to Project beneficiaries. The opportunity cost of capital is set at 12 percent. The economic analysis is based on direct costs and benefits. Social, institutional, and indirect benefits will not be considered. These include, for example, creation of employment, enhanced competition in input markets, enhanced national food security, export improvement, foreign currency earnings and emergence of farmers' organizations. An economic conversion factor of 0.9 has been considered for benefits generated by the Project.

68. The total benefits have been calculated by aggregating economic returns from:
    (a) The 50,000 ha under the insurance pilot scheme and the subsequent increases in insured farming area, assuming a 2 percent annual increase based on similar projects in the region.
    (b) The reduction in costs resulting from the canine management, assuming a reduction of 50 percent of the annual costs suffered by the society, with a phasing of benefits increase over 10 years.

(c) The improvement in water quality and effluent management in the Santa Lucia Basin as a result of the 200 farm-level investments in effluent treatment.
(d) The benefits of the transition of 700 producer to more agroecological practices.

69. Based on the assumptions, the EIRR for the base case scenario is 17.1 percent and the Net Present Value (NPV) is US$9.3 million. These results indicate that, based on an opportunity cost of capital of 12 percent, the Project shows a satisfactory EIRR and NPV, and is justified on economic grounds. The sensitivity analysis that considers, among other factors, future impacts of COVID-19 pandemic and climate change on the economy, confirms that the EIRR and NPV are robust (see Table 3 below). The analysis shows that even with a significant increase in costs or decrease in benefits, the economic viability remains strong. Only delays of over two years result in an EIRR below 12 percent (minimum acceptable level).

Table 3: EIRR sensitivity analysis

Base case scenario	Project Benefits					Project Costs		Delay in benefits	
	-30%	-20%	-10%	+10%	+20%	+10%	+20%	1 year	2 year
17.1%	8.8%	11.7%	14.4%	19.9%	22.7%	14.7%	12.6%	13.6%	11.2%
						Total costs		Total benefits	
Switching values						23%		-19%	

70. The carbon balance (net GHG emissions' reduction) of the Project has been evaluated and integrated into the economic analysis. In 20 years, the Project investments would lead to a reduction of about 1.12 million tCO_2eq emissions. The GHG emission reductions are included as shadow prices in the economic analysis following the World Bank's "Guidance note on the shadow price of the carbon in the economic analysis" (September 2017). A 'Low carbon price' (LCP) and 'High carbon price' (HCP) are included to complement the base case scenario. Under the LCP scenario, the economic internal rate of return (EIRR LCP) is 33 percent, the economic net present value (ENPV LCP) is US$29.9 million, the switching value for costs is +84 percent and the switching value for benefits is -46 percent. Under the HCP scenario, the economic rate of return (EIRR HCP) is 79.8 percent, the economic net present value (ENPV HCP) is US$50.1 million, the switching value for costs is +132 percent and the switching value for benefits is -58 percent.

Table 4: Summary of Economic Indicators - Baseline, LCP, and HCP case scenarios

Indicator	Baseline	LCP	HCP
EIRR	17%	33%	80%
ENPV (US$ million)	9.3	29.9	50.1
Switching value for costs	+23%	+84%	+132%
Switching value for benefits	-19%	-46%	-58%

B. Fiduciary (See Annex 1)

71. **Financial Management.** A Financial Management Assessment (FMA)[30] was carried out to assess the adequacy of FM arrangements in place at the Project Management Unit (PMU) under MGAP. In addition, the FMA covered the *Cooperativa Nacional de Productores de Leche S.A*. (CONAPROLE) and the *Instituto Nacional de la*

[30] The FMA was carried out between August and mid-October 2021 by the Financial Management Specialist assigned to the Project. In accordance with the Bank Policy: Investment Project Financing and Bank Directive: Investment Project Financing and in line with Bank Directive: Financial Management Manual for World Bank-Investment Project Financing Operations effective on March 1, 2010 and revised on September 7, 2021.

Leche's (INALE) FM arrangements since both organizations will support the PMU for the subproject scheme implementation under Subcomponent 2.4. The overall conclusion of the FMA is that: (a) the FM arrangements for the proposed Project are considered adequate; (b) the funds flow, disbursements, monitoring, auditing, and supervision arrangements have been designed in a way to respond to the Project's implementation arrangements; and (c) the residual FM risk associated with the Project is rated as Moderate. The Project's risk rating will be reviewed regularly during Project implementation. Currently, there are no outstanding or unsatisfactory audit reports for the active Bank Project (managed by the same PMU) under implementation.

72. Overall, the Public Finance Management (PFM) arrangements in Uruguay function well. Major strengths of Uruguay PFM systems are transparency of public finances and predictability and control in budget execution which are reasonably aligned with international standards and practices. Besides, policy-based fiscal strategy and budgeting also shows some strength, as per the 2012 Public Expenditure and Financial Accountability Review Report (PEFA) and subsequent reviews.[31] Nevertheless, the PFM system in Uruguay still has challenges to face in the areas of accounting and recording transactions of the Central Government. This Project is expected to make extensive use of Country's systems in terms of budgeting, flow of funds, and internal and external audits.

73. The FMA identified the following risks to the achievement of the Project Development Objective: (a) subproject schemes´ complexity; and (b) close coordination that will be required between the PMU and the organizations involved in the subprojects' implementation. The following specific mitigating measures will be implemented to cope with the identified risks: (a) MGAP will enter into subsidiary agreements with both CONAPROLE and INALE to implement the subproject scheme under subcomponent 2.4 which will detail their obligations under the Project (disbursement condition for Category 3); (b) specific flow of funds, disbursement arrangements and internal control procedures will be used under the different subprojects schemes; (c) preparation of a POM, including a section with FM arrangements (reflected as a Project effectiveness condition); (d) annual audit of the Project's financial statements following auditing standards and Terms of Reference (TOR) acceptable to the Bank; and (e) continued close Bank support and supervision.

74. The PMU will be responsible for the submission of audited financial statements. The external Financial Statement audit of the Project will be performed by Uruguay's Supreme Audit Institution (*Tribunal de Cuentas de la República, TCR*) following agreed Terms of Reference (TOR) acceptable to the Bank. The audit report (and any accompanying Management letter) should be submitted to the Bank no later than six (6) months after the end of each fiscal year.

75. No withdrawal shall be made for payments made prior to the Signature Date of the Loan Agreement, except that withdrawals up to an aggregate amount not to exceed US$7.1 million equivalent may be made for payments made prior to this date but on or after April 1, 2021.

76. Procurement. Procurement will be conducted following the Bank's 'Procurement Regulations for IPF Borrowers', issued in July 2016 and updated in November 2020, for the supply of goods, works, non-consulting and consulting services. For Open International Competitive Procurement, the Bank Standard Procurement Documents will be used. For National Open Competitive Procurement, the Borrower may use documents previously agreed with the Bank. For each contract to be financed by the Loan, the different procurement or consultant selection methods, the estimated costs, prior review requirements, and time frame will be agreed

[31] Main findings of the Uruguay Public Expenditure and Financial Accountability Review Report (PEFA) was published in December 2012 (*https://www.gub.uy/ministerio-economia-finanzas/comunicacion/publicaciones/informe-pefa-public-expenditure-and-financial-accountability-sobre*) and the Quality of Financial Management was regularly reviewed as part of the Country Policy and Institutional (CPIA) exercise. In 2018, it indicates there have been no major changes in country PFM environment.

between the Borrower and the Bank and reflected in the Procurement Plan. The Plan will be registered in the Systematic Tracking of Exchanges in Procurement (STEP) prior to process implementation. The Procurement Plan will be updated at least once a year, or as required to reflect actual project implementation needs and improvements in institutional capacity.

77. A procurement capacity assessment of the PMU at MGAP was carried out between August and mid-October by the Project's assigned Procurement Specialist in order to review the organizational structure for implementing the Project, and the experience of the existing procurement staff. As a result, it was concluded that the current staff in the unit count on prior experience implementing Bank-financed projects including the type of procurement expected under the Project. The Project's assigned Procurement Specialist also conducted procurement capacity assessments of CONAPROLE and INALE during the same timeframe, considering they will be implementing part of the activities foreseen under Component 3. For both entities, PROLESA (CONAPROLE) and INALE, simplified documents will be developed to simplify the implementation of procurement processes to be conducted following the Procurement Regulations from the Bank. These arrangements are further analyzed in the Project Procurement Strategy for Development (PPSD) prepared by the PMU and will be reflected in the Procurement Plan in STEP. The implementation arrangements and monitoring for the implementing entities will be addressed in the POM.

78. Based on the results of the capacity assessments conducted, the following actions are recommended to mitigate risks identified in the Procurement Risk Assessment and Performance Report (May 2021) and facilitate Project implementation: (a) the PMU, should strengthen the procurement team with an additional qualified procurement staff; (b) the arrangements for the subprojects, the arrangements for the implementation of Subcomponent 2.3, and the procurement activities to be implemented by PROLESA (CONAPROLE) and INALE, should be clearly defined in the POM; (c) simplified documents agreed with the Bank should be developed to support INALE and PROLESA in the implementation of said procurement activities, and (d) after an assessment conducted by the Bank, the use of the National Procurement Systems (SICE) has been approved for the publication of the procurement processes (opportunities and information on the award of contracts) and, eventually, for the receipt of offers and quotations.

79. The PMU has prepared a PPSD using a short form considering the scope of the foreseen procurement activities, to identify the most suitable procurement arrangements to manage these processes while efficiently achieving the expected outcomes. The PMU will reflect the activities derived from the PPSD in a Procurement Plan in the STEP System for the activities expected to be carried out during the first 18 months of the Project. Both the PPSD and the Procurement Plan for the Project will be updated regularly during Project implementation, in accordance with the needs identified.

80. Based on the above, the overall Project risk for procurement is Moderate. The combined fiduciary risk is also rated as Moderate.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

81. The overall E&S risk classification (ESRC) is Moderate. The Project is expected to result in overall positive environmental and social impacts, as the Project aims at (a) strengthening information systems for better environmental management and climate adaptation in agricultural production; (b) enhancing animal welfare with the ensuing contribution to human health and the environment; and (c) supporting a transition to agroecology in the agro-food sector, with a particular focus on women. Component 2 of the Project will support only small-scale works to demonstrate alternative agro-ecological production systems and improve water quality in the Santa Lucía Watershed area. Activities under Component 1 include technical assistance to improve the transition of the agriculture sector to a more environmentally sustainable, climate resilient and inclusive sector, as further detailed in the Environmental and Social Review Summary. The nature, scale, type, and characteristics of the activities being supported by the Project are not expected to generate any significant adverse environmental and social risks and potential impacts on human populations or the environment.

82. The Environmental Risk Rating is classified as Moderate. In general, minor civil works under Component 2 (e.g. investments in technologies for agro-ecological transition and effluent management of dairy farmers) have the potential to generate minor environmental risks and adverse impacts, such as consumption of water and raw materials for civil works, generation of solid waste from residual construction materials, nuisance related to particulate material generation, vibration and noise, and occupational health and safety hazards for the workforce. These environmental risks and potential impacts are predictable and expected to be localized, temporary and/or reversible, low in magnitude and not expected to cause serious adverse effects to the environment or people and workers. Instead, Project activities focusing on technical assistance, capacity building and systems to support transition to agro-ecological production are aimed at improving the management of natural resources and provide sustainability to the sector while reducing vulnerability and increase climate resilience and, hence, are expected to generate long-term environmental benefits.

83. The Social Risk Rating is classified as Low based on the type of project, nature of its activities (technical assistance, capacity building and minor civil works with low potential social impacts and risks) and the Borrower's institutional capacity and commitment to adequately manage social risks and impacts. The overall social impacts are expected to be positive since, in addition to the benefits noted above, the Project will promote hiring of women while also targeting young women among the main beneficiaries of support to agro-ecological transition in family farms. The Project's key social risks and potential impacts include: (a) Project Workers', as defined under ESS2, exposure to occupational, health and safety (OHS) risks, particularly COVID-19 virus during civil works, if such risks are not managed through adequate prevention and existing mitigation measures; (b) inadequate dissemination and/or accessibility of Project-related information to stakeholders, thereby hampering inclusive stakeholder engagement (targeting women) efforts throughout the project cycle.

84. Identified environmental and social risks and opportunities will be managed in line with the ESSs either through: (a) project design, which ensures that technical assistance activities under the project are undertaken under terms of reference that reflect and incorporate ESS requirements, (b) via the environmental and social risk management instruments (Environmental and Social Management Framework and Stakeholder Engagement Plan) that the Borrower prepared. The draft SEP and draft ESCP for the Project were disclosed prior to appraisal in-country for purposes of public consultations beginning the last week of September 2021. The draft ESMF was disclosed on October 26th, 2021 in the Bank's website and in country for purposes of public consultations. The SEP and ESMF will be revised to incorporate, as needed, stakeholders' inputs, and, thereafter, finalized, adopted and the final versions will be publicly disclosed in-country and on the Bank's website no later than one month after

Effectiveness, as set out in the ESCP. The Project is taking a framework approach because the details about the investments and their exact locations will be known after implementation begins. The ESMF provides the institutional and implementation arrangements (including roles and responsibilities of CONAPROLE and INALE for Sub-Component 2.4.) requirements, guidelines, and procedures for assessing project activities, and, where necessary, preparing and implementing the site-specific Environmental and Social Impact Assessments/Environmental and Social Management Plans (ESIA/ESMPs). The ESCP agreed upon with the Borrower for this Project also set out actions and measures that need to be carried out by the Borrower in line with the ESSs. The negotiated and final version of the ESCP was disclosed on October 26th in country[32] and October 27th, 2021 on the Bank's website.

85. The Borrower's framework in connection to Labor and Working conditions (ESS2) has been approved for use in this Project. A Project-specific Labor Assessment of the Borrower Framework for ESS2 was conducted and benefited from preliminary consultations with key authorities: the PMU, Ministry of Labor and Social Security and MGAP. The draft Assessment was publicly disclosed in August 2021 on the Project's website to enable a robust and comprehensive stakeholder consultation until the end of September 2021. Targeted and tailored questionnaires were sent with the draft Labor Assessment to a wide variety of stakeholders to solicit their comments. The Labor Assessment was revised to incorporate stakeholders' feedback. The final version was disclosed in country on October 26th (via the same link) and on the Bank's website on October 27th, 2021.

86. The Labor Assessment's consultation process involved relevant governmental authorities, including the: Ministry of Labor and Social Security and its General Inspectorate for Labor and Social Security, MGAP, Security Social Bank, State Insurance Bank, and Ministry of Social Development. It also involved trade unions, and other non-governmental and international organizations, as further detailed in the ESRS. The following key gaps with ESS2 were identified: (a) the lack of an explicit legal requirement to have contracts in writing; and (b) the lack of an explicit legal requirement to provide a written notice of termination of employment. These gaps are addressed in the ESCP, which requires written contracts for all Project workers and to provide advance notice in case of employment termination. To further improve management of labor and working conditions under the Project, awareness raising activities on labor rights have been included in the ESCP, as detailed in the Labor Assessment.

87. The PMU has capacity to adequately manage environmental and social risks for projects. and is currently executing the World Bank financed DACC project, with a ESS rating of Satisfactory. The World Bank team conducted a capacity assessment of the PMU during project preparation and confirmed the capacity of the PMU to manage environmental and social risks in line with the ESSs. The PMU is staffed with specialists experienced in safeguards and acquainted with the ESSs following participation in several training and capacity building initiatives organized by the Bank. Necessary budget has been clearly identified. The ESMF includes responsibilities of this unit and its relationship with other institutions that will be co-responsible for implementing the environmental and social management of this Project.

V. GRIEVANCE REDRESS SERVICES

88. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent

32 https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/evaluacion-del-marco-ambiental-social-del-prestatario-para-proyecto

Inspection Panel which determines whether harm occurred, or could occur, because of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For more information on how to submit complaints to the World Bank Inspection Panel, please visit *www.inspectionpanel.org*.

VI. KEY RISKS

89. The overall project risk is rated Moderate. There are no areas of Substantial or High risk identified for this project.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Uruguay

Uruguay Agro-Ecological and Climate Resilient Systems Project

Project Development Objectives(s)

(i) strengthen agricultural public systems and rural producers to increase climate change adaptation and mitigation actions and promote Agro-ecological production; and (ii) respond effectively in case of an Eligible Crisis or Emergency.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Climate Change Public Goods			
Number of producers using climate change information and data services and tools provided by the project (Number)		0.00	12,000.00
Women accessing climate change information and data services and tools provided by the project (Number)		0.00	4,200.00
Men accessing climate change information and data services and tools provided by the project (Number)		0.00	7,800.00
Collaboration across technical entities in the agriculture sector improved (Number)		0.00	5.00
Agroecological Transition			
Land area under sustainable landscape management practices (CRI, Hectare(Ha))		400,000.00	1,500,000.00
Farmers adopting improved agricultural technology (CRI, Number)		0.00	2,020.00

Indicator Name	PBC	Baseline	End Target
Farmers adopting improved agricultural technology - Female (CRI, Number)		0.00	800.00
Farmers adopting improved agricultural technology - male (CRI, Number)		0.00	1,220.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	End Target
Climate Change Public Goods			
Number of digital products developed for management of natural resources and climate risks (Number)		0.00	4.00
Area with information for management of climate risks for agriculture risk insurance (Hectare(Ha))		50,134.00	300,000.00
Area monitored by the Agricultural Monitoring System (DMA) (Hectare(Ha))		303,000.00	1,150,000.00
Are of the country with cartography 1:40.000 (Percentage)		45.00	75.00
Number of beneficiaries capacitated in the use of Ministry information systems (Number)		0.00	500.00
Female beneficiaries capacitated in the use of Ministry Systems (Number)		0.00	250.00
Male beneficiaries capacitated in the use of Ministry Systems (Number)		0.00	250.00
Number of women receiving tablets and digital literacy technical assistance (Number)		0.00	2,000.00
Domestic dogs registered in national traceability system (Number) (Number)		0.00	500,000.00
Agroecological transition			

Indicator Name	PBC	Baseline	End Target
National Plan for Agroecology in execution and implementation arrangements established (Yes/No)		No	Yes
Number of Producers supported with Subprojects for an agroecological transition (Number)		0.00	700.00
Women supported with Subprojects for an agroecological transition (Number)		0.00	210.00
Men supported with Subprojects for an agroecological transition (Number)		0.00	490.00
Number of Subprojects supporting effluent management technologies in priority watersheds (Number)		370.00	570.00
Public goods generated through agroecological transitions (Number)		0.00	4.00
Producers with knowledge and skills of agroecological transitions (Number)		0.00	3,300.00
Producers with knowledge and skills of agroecological transitions - women (Number)		0.00	1,650.00
Producers with knowledge and skills of agroecological transitions - men (Number)		0.00	1,650.00
Project Management			
Grievances received that are addressed (Percentage)		0.00	100.00
Beneficiaries reporting satisfaction with design and implementation of subprojects (Percentage)		0.00	85.00
Women reporting satisfaction with project supported subprojects (Percentage)		0.00	85.00
Men reporting satisfaction with project-supported subprojects (Percentage)		0.00	85.00
All beneficiaries of project investments (Number)		0.00	17,400.00
Beneficiaries of project investments - women (Number)		0.00	6,900.00
Beneficiaries of project investments - men (Number)		0.00	10,500.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Number of producers using climate change information and data services and tools provided by the project	Number of producers that use tools and digital information services offered by the Project including information about climatic risks in crops (soil use and management plans, cartography, insurance, subprojects)	Every 6 months	Data from Unique Registry of Ministry information systems users	Online systems	Project Management Unit (PMU)
Women accessing climate change information and data services and tools provided by the project					
Men accessing climate change information and data services and tools provided by the project					
Collaboration across technical entities in the agriculture sector improved	Number of Memorandum of Understands (MOUs) or institutional agreements signed between the MGAP and other institutions working in the agriculture sector, including CONAPROLE, INALE, INIA, Ministry of Environment, Plan Ceibal and/or others.	Every 6 months	UGP	Databases	Project Management Unit (PMU)

Land area under sustainable landscape management practices	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.	Every 6 months	Area under management measured through the system of climate crop risk system, insurance system, agricultural c hemical monitoring system, and subprojects for transition to agroecology, including water management in Cuenca Santa Lucia	Aggregating land under sustainable management under project activities	Project Management Unit (PMU)

Farmers adopting improved agricultural technology	This indicator measures the number of farmers (of agricultural products) who have adopted an improved agricultural technology promoted by operations supported by the World Bank. NB: "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber and non-timber forest products. Adoption refers to a change of practice or change in use of a technology that was introduced or promoted by the project. Technology includes a change in practices compared to currently used practices or technologies (seed preparation, planting time, feeding schedule, feeding ingredients, postharvest storage/ processing, etc.). If the project introduces or promotes a technology package in which the benefit	This is the sum of the recipients of subprojects, insurance services, and producers adopting agroecological practices due to demonstration sites. Every 6 months	Sum of technologies adopted under Cuenca Santa Lucia and agroecological subprojects		Project Management Unit (PMU)

	depends on the application of the entire package (e.g., a combination of inputs such as a new variety and advice on agronomic practices such as soil preparation, changes in seeding time, fertilizer schedule, plant protection, etc.), this counts as one technology. Farmers are people engaged in farming of agricultural products or members of an agriculture related business (disaggregated by men and women) targeted by the project.				
Farmers adopting improved agricultural technology - Female					
Farmers adopting improved agricultural technology - male					

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Number of digital products developed for management of natural resources and climate risks	Digital systems for better decision making, including insurance, animal wellbeing, monitoring of agricultural chemicals, register and	Every 6 months		Project Management Unit (PMU)	

	traceability of agricultural chemicals and veterinary products.				
Area with information for management of climate risks for agriculture risk insurance	Number of hectares with detailed information for risk estimation and covered under insurance (accumulated) in the Pilot implemented by the Project.	Every 6 months	Digital tool		Project Management Unit
Area monitored by the Agricultural Monitoring System (DMA)	Number of hectares monitored by the DMA system	Continuous			Project Management Unit (PMU)
Are of the country with cartography 1:40.000					
Number of beneficiaries capacitated in the use of Ministry information systems	The number of people who are trained to use the information systems that the Ministry builds under Component 1	Every 6 months	Project Management Unit	Project Management Unit	Project Management Unit
Female beneficiaries capacitated in the use of Ministry Systems					
Male beneficiaries capacitated in the use of Ministry Systems					
Number of women receiving tablets and digital literacy technical assistance	Number of women receiving tablets and digital literacy technical assistance from the project	every 6 months	PMU	PMU data collection	PMU
Domestic dogs registered in national traceability system (Number)					
National Plan for Agroecology in execution and implementation arrangements established	Development of the National Agroecology Plan and established implementation	Continuous			

	arrangements				
Number of Producers supported with Subprojects for an agroecological transition					
Women supported with Subprojects for an agroecological transition					
Men supported with Subprojects for an agroecological transition					
Number of Subprojects supporting effluent management technologies in priority watersheds					
Public goods generated through agroecological transitions	The definition of public goods will be generated by the studies elaborated by INIA	Every 6 months			
Producers with knowledge and skills of agroecological transitions	Number of people trained in agroecological transitions. This includes all beneficiaries of subprojects, those who self-invest in agroecological practices and beneficiaries of demonstration sites.	Every 6 months			
Producers with knowledge and skills of agroecological transitions - women					
Producers with knowledge and skills of agroecological transitions - men					
Grievances received that are addressed	All Grievances received that are addressed within one month of receipt.	Continuous	PMU	PMU through Ministry GRM channels	PMU
Beneficiaries reporting satisfaction with design and implementation of subprojects	Beneficiaries who are satisfied with project	twice during the	Beneficiary surveys		Project Management Unit

	activities according to satisfaction surveys	project			
Women reporting satisfaction with project supported subprojects					
Men reporting satisfaction with project-supported subprojects					
All beneficiaries of project investments	This indicator will measure the total number of people directly benefitting from project activities, including the family members of the producer directly benefitting from actions. The total number is calculated by the number of people benefitting from MGAP information services (target 12,000) plus all of those benefitting from insurance (250), subprojects (600) and demonstration sites (500) plus their family members, assuming 4 people in a nuclear family. (12,000+(250+600+500*4)= 17,400)	Every 6 months	Sum of all beneficiaries	Project Management Unit	Project Management Unit
Beneficiaries of project investments - women					
Beneficiaries of project investments - men					

Annex 1: Implementation Arrangements and Support Plan

A. INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION

1. **Project Duration, Execution and Oversight**. The Project will have a five-year duration from the expected date of Board approval, considering the period required for effectiveness. Overall project management and implementation will be the responsibility of the Ministry of Livestock, Agriculture and Fisheries (MGAP), on behalf of the Government of Uruguay (GoU).

2. MGAP will rely on the existing Project Management Unit (PMU) within MGAP used to execute international financing and used to administer the DACC project. The PMU will be led by a Project Coordinator and composed of a team of qualified professionals dealing with general management (planning, coordination, administration, etc.) and technical and normative functions. Adequate staff will be appointed to the technical unit based on specific Terms of Reference and qualifications adequate to the role envisaged for them under the project. The PMU structure is comprised of the following units:

a) **Financial Coordination Unit**, to oversee all fiduciary matters of the project, including financial management and procurement.
b) **Planning, Monitoring and Evaluation Unit**, to prepare Action Plans, and manage the Monitoring system. Will be responsible for disseminating the procedures and guidelines of the project, as well as preparing the Annual Operational Plan (POA) and executing the monitoring system. Information management will be carried out by establishing a physical and financial information system. It will be responsible for managing the evaluation systems, and preparation of all results and impact evaluation reports.
c) **Communication and Dissemination Unit**, to disseminate project information and materials in line with the actions and procedures set forth in the Stakeholder Engagement Plan (SEP). It will coordinate the dissemination of project information and materials to promote understanding and transparency, including the maintenance of a web page, the distribution of promotional videos, folders, posters, etc., and the execution of campaigns to disseminate the project.
d) **Technical Unit (TU)**, to manage technical assistance operational activities at the field level and related to the execution of the project.

3. The PMU will implement a Grievance Redress Mechanism (GRM) – *Sistema de Información y Atención a Quejas* – to receive, respond, monitor, and report on the grievances of project beneficiaries, communities or any individual who considers that the implementation of the project has adversely affected them. The PMU will review and respond to all grievances received through the GRM within one month of receipt, including those submitted anonymously. The timely response to complaints is an indicator included in the Results Framework.

4. The PMU will coordinate with MGAP's Communication Unit on the design of a Strategic Communication Plan (PCE: Strategic Communication Plan) for the Project in line with the commitments and actions proposed, which will aim to keep interested parties informed of its progress. The PCE will have two axes: (a) for internal clients and (b) for external clients. In the case of internal clients, they will design information communication mechanisms on operational aspects of the project, such as: dissemination of windows, conditions to participate in the project, eligibility criteria, services or benefits of the project, communication channel (contacts and address office), etc. For this, the Communication Unit will prepare graphic and audiovisual material for its effective dissemination, considering the reality of the regions and the population (women and men, youth, and indigenous

communities). Local and regional workshops will also be prepared to disseminate information about the project and its results. In the case of external clients, actions will be designed to disseminate results to the general public and those people and institutions that are not beneficiaries of the project.

Planning, Monitoring and Evaluation.

5. **The Project will monitor and evaluate the Project's progress and results at the technical, financial, social, and environmental levels.** The PMU M&E Unit will: (a) monitor the day-to-day activities and outputs of the project generating and systematizing information for management; (b) support the project budgeting process; (c) monitor project outcomes and the progress of indicators at the end of each semester; (d) monitor results at a technical and financial level; (e) provide inputs for the communication of project results and lessons learned; (f) establish a communication mechanism with field staff of the Ministry; (g) promote accountability for resource use against objectives; (h) provide and receive feedback from stakeholders; (i) monitor implementation of and report on project E&S instruments as well as subproject level ESMP, as applicable; and (j) undertake special evaluation studies and generate inputs for dissemination of project results and lessons learned and for the periodic evaluation.

6. **The PMU will be responsible for collecting and systematizing the baseline information of all subprojects applying to receive project financing, through surveys of communities specifically designed for this project**. This survey will reveal socioeconomic, productive, environmental, and organizational information, before receiving the funds to implement the project or that technical assistance is granted. The baseline analysis should disaggregate by gender, age, and identify specific gaps for women, youth, indigenous peoples, afro-descendants and other (e.g., persons with disabilities).

7. **The PMU will be responsible for the administrative management of the Project and will perform management control audits**. Likewise, it must have specialists to safeguard compliance with the applicable environmental and social standards as set forth in the environmental and social instruments of the Project. In addition, the PMU will contract external audits to validate the use of financial resources and internal disbursement controls.

8. **Joint supervision.** Joint semi-annual supervision missions with WB staff will be carried out to assess the status of key project results and compliance with legal agreements. The PMU will prepare Semiannual Progress Reports that will cover successive six-month periods to be sent to the World Bank for consideration. The Reports will present the physical and financial progress of the Project, based on the planned activities, and the results of the Project based on the Results Framework. They will also present any problems faced during implementation and describe the corrective measures considered. They will report on compliance with E&S standards as set forth in the environmental and social instruments of the project, including information on GRM implementation.

9. **The Bank and MGAP will carry out a Mid-Term Review once 40 percent of the resources are committed, or when 50 percent of the original implementation period has passed, whichever comes first**. MGAP will prepare a Mid-Term Review (MTR) report. The objective of this evaluation will be to assess whether the execution is satisfactory in terms of physical, financial and impact results, towards the PDO objectives and results indicators. The MTR will be carried out based on a review of documents and field information, through data collected from a representative sample with a questionnaire prepared specifically for these purposes. The MTR will give recommendations for methodological adjustments to be implemented to correct identified deviations from the planning or emerging challenges: for each component, the evaluation will highlight the challenges faced and the

responses adopted by the PMU to address them; it will also give preliminary recommendations regarding the design, implementation, and management of the project. The results of the MTR will be compared with the indicators reported in the latest Results Framework, in order to evaluate consistency of the results. OPYPA will be engaged to produce rigorous impact evaluation studies to complement the assessment of the Project's results and derive lessons for policymaking.

10. **At project closure, MGAP will carry out a final evaluation of the Project (Borrower's Completion Report).** The final evaluation will be conducted to evaluate the results of the Project and identify lessons learned and challenges to consider in new operations, including the sustainability of the project results. This final evaluation must begin once 90 percent of the resources have been disbursed, or six months before the Project closes, whichever comes first. The final evaluation must establish the causal relationship between the interventions of the Project and the outcome variables and conclude how the Project has generated changes in the results. The key variables that will be evaluated will be (at least) the PDO indicators as well as the Intermediate Indicators in the Results Framework. The analysis should consider social and environmental variables, including a disaggregated analysis for subgroups of interest such as gender and youth. Likewise, it should consider the degree of satisfaction expressed by Project beneficiaries.

Financial Management and Procurement

11. A Financial Management Assessment (FMA)[33] has been carried out to determine and agree the applicable FM arrangements to support the project's implementation. The scope of the FMA included: (a) an evaluation of existing FM systems in place to be used for Project budgeting, monitoring, accounting and reporting; (b) a review of staffing arrangements; (c) a review of the flow of funds arrangements and disbursement methods to be used (including those under the two subproject schemes (Subcomponents 2.3 and 2.4); (d) a review of internal control mechanisms in place, including the internal audit and those related to the subproject schemes; (e) a discussion with regards to reporting requirements (including those under the subproject schemes), including the format and content of IFRs for reporting purposes; and (f) a review of the external audit arrangements. Findings of the FMA indicate that the FM arrangements in place at PMU can record the project's transactions and produce the requisite financial reporting to monitor the project. Currently, there are no outstanding or unsatisfactory audit reports for the active Bank project (managed by the same PMU) under implementation. The FM and disbursement arrangements, including under the different subproject schemes, were confirmed during appraisal.

12. **Implementing entity.** The Project will be implemented by the Ministry of Livestock, Agriculture and Fisheries (MGAP) through its PMU, which is also in charge of the implementation of the Bank's DACC Project[34] and the closing of FCPF REDD Readiness Preparation Project[35]. The PMU will be responsible for the FM aspects comprising: the project's budget formulation and execution, overall flow of funds and disbursement arrangements including transfers to the subprojects' supporting organizations (CONAPROLE and INALE), assuring adequate and timely financing of eligible expenditures, maintaining the project's accounting records and preparation of interim and annual financial reporting, and complying with the project's external auditing arrangements. The PMU will also be supported by CONAPROLE and INALE under the subproject scheme as detailed below.

[33] The Financial Management Assessment (FMA) is conducted in accordance with Bank Policy: Investment Project Financing and Bank Directive: Investment Project Financing and in line with Bank Directive: Financial Management Manual for World Bank- Investment Project Financing Operations effective March 1, 2010 and revised on September 7, 2021.
[34] P124181- Uruguay Sustainable Management of Natural Resources and Climate Change Project, partially financed by the Loan 8099-UY and its additional financing Loan 8794-UY, amounting to US$ 49 and US$ 42 million, respectively, with closing date on November 16, 2021.
[35] P151978- Uruguay FCPF REDD Readiness Preparation Project, partially financed by the Trust Fund A1064-UY amounting to US$ 3,8 million closed on June 15, 2021.

13. **Organization and Staffing.** The PMU's "Gerencia *de Administracion y Finanzas*" is composed by qualified professionals with relevant experience in implementing other Bank-financed projects, as well as operations from the other international financial institutions[36]. The FM Coordinator reports to the Project Coordinator and leads the Accounting Department composed by a FM Specialist and a FM Assistant and the Financial Department composed by two Treasury staff. The PMU's Organization Chart is clearly defined. Staff's roles, responsibilities and oversight lines allow adequate segregation of duties and are included in the OM. FM personnel are qualified and capable of undertaking the FM function of the Project. No additional FM staff will be required/hired, most likely because both the DACC Project and FCPF REDD Readiness Preparation Project will be closed by the time this operation is expected to be effective.

14. **Planning and Budgeting.** Uruguay's budget system is well-suited for the implementation of the proposed operation. The institutional framework that governs the preparation of the National Budget involves a range of entities including the OPP (Budget & Planning Office) and various departments within the Ministry of Economy and Finance (MEF). Uruguay has a five-year budget that operates in practice as a medium-term fiscal framework[37]. This plan is the basis for a monthly cash planning, agreed bilaterally between MEF and each spending unit included in the National Budget. Project transactions will flow through the Government Integrated Financial Information System (*Sistema Integrado de Información Financiera, SIIF*) to control the allocated budget. Budget operations are accounted for in the SIIF and controlled by the Accountant General Office (*Contaduría General de la Nación, CGN*). The PMU in conjunction with the Accounting and Finance Division of MGAP will be responsible for preparing the Project's specific budget. For planning purposes, the PMU's Planning Division will lead the planning process of the whole Project with specific procedures to require and monitor financial information under each subcomponent. As part of the internal control framework, each government entity has a Central Accountant that is in charge of validating each spending decision for legality and control of the budget costs. The application for this type of control is applied for all types of expenses, regardless of their amount. All the Project's budgeting transactions will be processed through the SIIF. Spending decisions are registered in SIIF and include a set of accounting sequences for adequate commitment and payment control, and to keep expenses within set budget limits and cash projections. The monitoring and control of budget execution is carried out through standard management reports generated by SIIF and reviewed monthly by the PMU FM Coordinator. Actual expenditures are compared to budgeted expenditures, with reasonable frequency, and justifications provided for budget variations.

15. **Accounting and Financial Reporting.** For accounting matters, the Project will use the SGI Information Technology (IT) system. This system is already in place and functioning well, although it is important to mention that the budgeting system SIIF is not interfaced with the SGI system. Therefore, the PMU will implement manual controls aimed at ensuring the integrity and accuracy of data between both systems. The PMU will be responsible for: (a) maintaining the Project's accounts with the Chart of accounts reflecting the Project categories, components, and source of funding; and (b) producing the requisite of semi-annual Interim Financial Reports (IFR) and annual financial statements. Those reports will be prepared on a cash accounting basis using the standard formats agreed with the Bank. The IFR will be submitted to the Bank within forty-five (45) days after the end of the reported period. These reports will be used by PMU management to monitor the Project, including comparisons of actual vs. budgeted expenditure. The Chart of accounts (that is adequate, and can be adapted to properly account for, and report on all the Project's activities), format and content of the IFR and annual financial

[36] Inter-American Development Bank (IDB), Global Environment Fund, and Food and Agriculture Organization of the United Nations (FAO).
[37] The five-year budget can be modified through several legal procedures. The main tool for modifying budgeted allocations is the so-called *Rendición de Cuentas* (RdC), which are fundamentally budget execution reports, prepared yearly by the Executive before June 30 of the following year, made publicly available and submitted to Congress for approval. Budget law No. 19.924 for the period 2020-2024 passed by the Legislature in December 2020.

statements will be included in the OM. There are written policies and procedures covering all routine accounting and related administrative activities and only authorized persons, may change or establish new accounting principles, policies, or procedures. The accounting function within the PMU is adequately staffed with experienced and qualified persons. The PMU will also have access to the Bank's Client Connection system for up-to-date information relating to the disbursement of the proceeds of the Loan. The Project's accounting records in SGI and SIIF will be reconciled on a regular basis with this information.

Table A1.1 shows the schedule of financial reports to be submitted to the Bank:

Table A1.1: Reports' Schedule

Report	Due date
Semi-annual unaudited IFRs reflecting the sources and uses of funds for each semester and cumulative uses by category, including beginning and ending cash balances.	Within forty-five (45) days after the end of each calendar semester
Annual audit report on project financial statements	Within six (6) months after the end of each calendar year (or other period agreed with the Bank).
Special opinions on SOEs and Designated Account	
Management letter identifying any internal control weaknesses and areas for improvement	

16. **Internal Auditing and internal controls.** MGAP has an Internal Audit Department (IAD). This unit has technical autonomy and unlimited access to financial records and is technically supervised by the Government's Internal Audit Office (*Auditoria Interna de la Nacion*, AIN) which depends functionally and financially on the MEF. AIN prepares an annual audit plan and progress is measured periodically. There have been no IAD reports covering the Bank's projects for the last years. The internal audit function is fully effective. Internal audit reports issued by the AIN under MGAP Divisions are publicly available in the official AIN website[38]. When internal control weaknesses are highlighted in the reports along with auditors' recommendations, action plans are requested including measures to be adopted, deadlines and responsible for its implementation. However, no systematic follow up on audit findings and action plans to address auditors' recommendations are evidenced. At this stage, the Project has not been included in IAD's internal audit plan for the next year. There is adequate segregation of duties at the PMU to maintain an adequate level of control. The internal control environment to be used for the Project is anchored in Uruguay's legal and institutional framework and MGAP operational processes and procedures i.e., approval and authorization controls are in place and properly documented. The process flows appear to be well understood by PMU personnel. Bank reconciliations are performed regularly. All accounting and support documents are retained on a secure basis, using an electronic system that allows for easy retrieval for the authorized user. The IT department of MGAP is well staffed with adequate personnel, and detailed procedures are in place to ensure the integrity of data captured by the various IT systems, including daily back-ups of all data, in an alternative secure location. Fixed assets/inventories are also controlled, with regular asset/inventory counts, reconciled with control accounts and procedures in place to control the disposal/sale of assets. The Project's internal control system will also be documented in the OM. The OM will comprise descriptions, flow charts, policies, templates and forms, user-friendly tools, tips, and techniques to ensure that the approval and authorization controls continue to be adequate and are properly documented and followed with adequate safeguarding of the Project's assets. The OM will be prepared by the PMU and be approved by the Bank and be maintained/updated throughout the Projects' life. Detailed procedures to monitor the flow of funds and disbursement arrangements under the CONAPROLE and INALE's subsidiary agreements (Subcomponent 2.4) and the subproject scheme implemented by MGAP (subcomponent 2.3) will be described in the OM.

[38] *https://www.gub.uy/ministerio-economia-finanzas/comunicacion/publicaciones/informe-actuaciones-del-sector-publico/informe-actuaciones-del-sector*

17. **External Auditing Arrangements.** The Project's external audit will be performed by the Uruguayan Supreme Audit Institution (*Tribunal de Cuentas de la República*, *TCR*) following Terms of Reference (TOR) and acceptable to the Bank, and in accordance with International Standards of Supreme Audit Institutions (ISSAIs) (issued by the International Organization of Supreme Audit Institutions (INTOSAI). The audit report (and any accompanying Management letter) should be submitted to the Bank no later than six months after the end of each fiscal year. In accordance with the Bank's Access to Information Policy, upon receipt of the annual audited financial statements of the Project, they will be made available to the public (but not the Management Letter) by the Bank. TORs will be included in the POM. There are no overdue audit reports and/or outstanding FM or audit issues affecting the PMU at this moment.

FMA of CONAPROLE for Subcomponent 2.4.

18. **Implementing Agency.** CONAPROLE is the National Dairy Famer Cooperative[39] and was created by Law 9.526 of December 14, 1935. CONAPROLE has some 1,800 staff members and is administered by a Board of Directors made up of five members (a President and four members), who are appointed by members of the Cooperative every five years. The Board of Directors is made up of professionals with extensive experience, who are part of the different committees established within CONAPROLE. The Board of Directors relies on an executive structure headed by General Management, which has a staff of professionals, also with extensive experience and training, according to the size and complexity of its operations. The *Productores* and *Finanzas* Division will lead the technical and administrative support for the formulation, implementation and closing of the subprojects partially financed by the Project. The organization chart is publicly available in the official website[40]**.**

19. **Planning**. CONAPROLE prepares a strategic five-year plan and the Annual Action Plan which are approved by the Board of Directors and the General Management. Activities to be implemented under the Subcomponent 2.4 will be included in the CONAPROLE's planning.

20. **Internal Controls.** CONAPROLE has two internal control bodies: a) the *Comision Fiscal* created by Law 17.292 in 2001; and b) the Internal Audit Management which reports to the *Auditoria y Vigilancia Committee.* There are written policies and procedures covering all routine accounting and related administrative activities. Subcomponent 2.4's transaction processing will use CONAPROLE's internal approval processes and systems, that provide for reasonable segregation of duties, supervision, quality control reviews and reconciliation.

21. **Accounting.** CONAPROLE's financial transactions are recorded in SAP. The system will be used for recording the transfers (advances) received by CONAPROLE from the PMU and payments made by CONAPROLE for the goods and services under the Subproject Agreements. The Procurement function under the subprojects will be provided by PROLESA[41], a private company that belongs to CONAPROLE which has the specific role of providing goods and services to the producers that are part of the Cooperative. Individual records for the goods and services provided to beneficiaries will be maintained by CONAPROLE and then reflected by the PMU in the SGI.

22. **External control.** CONAPROLE's external auditor is PWC. Qualified opinions on the annual financial statements as of July 31, 2020 and July 31, 2019 were issued by PWC due to investments in other companies being included in CONAPROLE's consolidated annual financial statements, despite there not being audited financial statements for these other companies for the same period; consequently, those investments reported in

[39] Cooperativa Nacional de Productores de Leche (CONAPROLE) is Uruguay's leading dairy producer and one of the lowest cost producers in the world. CONAPROLE has eight production plants in which they produce a wide range of dairy products, both for the local and export market.
[40] *https://www.conaprole.uy/institucional/autoridades/*
[41] Productores de Leche S.A. (PROLESA). Since 1994 it has been dedicated to providing a wide variety of inputs and services for the production of dairy establishments remitting to CONAPROLE.

CONAPROLE's consolidated financial statements could be subject to adjustments. The annual financial statements show that CONAPROLE is a stable cooperative. The 2020 Annual Report and Financial Statements are publicly available[42].

FMA of INALE for Subcomponent 2.4.

23. **Implementing Agency.** INALE is the National Milk Institute[43], a legal entity established under the non-state public law. It is composed by permanent and qualified staff and administered by the Executive Board which relies on an executive structure headed by Technical Management, which has a staff of permanent professionals. *Programas y Proyectos* and *Administracion y Finanzas* Departments will be directly involved in the implementation of the subprojects partially financed by the Project. The organization chart, divisions' responsibilities and list of staff are publicly available in the official website[44].

24. **Planning.** INALE prepares a strategic five-years plan and the Annual Action Plan. Activities to be implemented under the Subcomponent 2.4 will be included in the INALE's action plans.

25. **Internal controls.** There are written policies and procedures covering all routine accounting and related administrative activities. Subcomponent 2.4's transaction processing will use INALE's internal approval processes and systems, that provide for reasonable segregation of duties, supervision, quality control reviews and reconciliation.

26. **Accounting.** INALE's financial transactions are recorded in an accounting system called Alexis[45]. The system will be used for recording the transfers (advances) received by INALE from the PMU and payments made by INALE for the goods and services under the Subproject Agreements. Individual records for the goods and services provided to beneficiaries will be maintained by INALE and then reflected by the PMU in the SGI.

27. **External control.** INALE's financial statements audits were performed by private audit firms which issued a favorable opinion and without qualifications on INALE's 2018 and 2019 annual financial statements[46]. Furthermore, INALE is subject to regulatory legal framework of the Public Financial Management (PFM) system in Uruguay and is governed by provisions of the Accounting and Financial Administration Annotated Text (*Texto Ordenado Ley de Contabilidad y Administración Financiera*, TOCAF) on which the TCR requires the financial statements for endorsement[47]**.**

28. **FM arrangements under the subproject scheme (Subcomponent 2.4).** CONAPROLE and INALE will support the implementation of the subproject scheme under Subcomponent 2.4 and will be responsible for: (a) managing a segregated Bank account in US$ (separate account for each) for receiving advances made by the PMU to each respective entity based on forecasted expenditures for the next two months under the Subproject Agreements; (b) making the payments for the provision of services and goods (in the case of CONAPROLE, the goods and services will be procured by PROLESA), following Bank's 'Procurement Regulations; (c) recording transactions under the Subproject Agreements with each beneficiary; (d) maintaining internal control procedures and periodic

[42] *http://www.conahorro.com.uy/wp-content/uploads/2020/10/Memoria-anual-CONAPROLE-2020_con-Anexos-comprimido.pdf*
[43] Instituto Nacional de la Leche (INALE) was created by Law 18.242 of December 27, 2007.
[44] https://www.inale.org/transparencia/organigrama/; *https://www.inale.org/transparencia/facultades-de-las-unidades/*; and *https://www.inale.org/transparencia/recursos-humanos/*
[45] https://www.saico.com.uy/productos/alexis
[46] 2018 and 2019 audited financial statements, respectively: *https://www.inale.org/historico/wp-content/uploads/2018/09/Informe-Auditoria-31122018.pdf*; *https://www.inale.org/wp-content/uploads/2020/10/INFORME-DE-AUDITORIA.2019pdf.pdf*
[47] 2019 financial statement endorsement by TCR: *https://www.inale.org/wp-content/uploads/2020/10/Resolucion-del-Tribunal_de_Cuentas_EEFF_2019.pdf*

reconciliations; (e) preparing and submitting information to PMU regarding subcomponent 2.4, to enable the PMU to prepare the IFRs and the documentation of expenditures to the Bank; and (f) preparing and providing all financial documentation and Project reports/information requested by the PMU for monitoring purposes, external auditors and Bank staff, related to Subcomponent 2.4. The PMU will document, and the Bank will record the expenditure in the loan account at the time of reporting (i.e., actual method) by the PMU of the actual expenditures incurred. CONAPROLE and INALE will have to submit supporting documentation evidencing actual expenditures for all amounts spent and refund any unused funds. All subproject activities will also need to be completed before the Closing Date to be considered eligible. 200 subprojects[48] are envisaged and beneficiaries will be dairy producers' farms in the Cuenca Santa Lucia watershed. It is expected that CONAPROLE and INALE will implement 75 percent and 25 percent of those subprojects[49], respectively. This activity will be under the technical leadership of DGRN in collaboration with the Ministry of Environment (MOE). Internal controls already in place at the PMU in conjunction with the DGDR for the supervision and monitoring of subprojects will be applied for this subcomponent. CONAPROLE and INALE will pay for the expenditures to be incurred under each subproject. Payments made from CONAPROLE and INALE to the providers of the goods and services will be in US$. No transfers of funds will be made to the beneficiaries. The support provided by this subcomponent will accordingly cover 80 percent of the investment costs for each farm, up to a limit of US$16,000 per farm. In addition, producers will contribute towards operational and maintenance costs to cover the remaining cost of the investments (20 percent). Total cash contributions from the beneficiaries amounting to US$ 300,000 will be provided.

29. **Flow of funds and disbursement arrangements.** The following disbursement methods may be used under the loan: (a) Advance, (b) Reimbursement and (b) Direct Payment**.** The Project's funds will be managed by the PMU through a specific segregated Designated Account (DA) and denominated in the loan currency (US dollars), which will be opened at the Central Bank of Uruguay (BCU). This account will receive advances from the Loan account and will be replenished by the Bank as execution progresses. The DA will have a Fixed Ceiling of US$ 5 million. The frequency for reporting eligible expenditures paid from the DA will be once every three (3) months. In addition, two operating accounts will be opened at the *Banco Republica* (BROU) acceptable to the Bank and managed by PMU: one in U.S. dollars which proceeds from the DA will be transferred and other in local currency to handle payments of eligible expenditures to local providers. These transfers will take place based on forecasted expenditures for the next two months. Under this modality, PMU will document eligible expenditures to the Bank using Statements of Expenditures (SOEs). At the request of the Government, the Bank will make Direct Payments to vendors based on requests for payments and Records. Reimbursement of eligible expenditures will also be permitted. The Project's Minimum Application Size will be defined in the Disbursement and Financial Information Letter (DFIL). The Project will have a four (4) month Grace Period. While most of the disbursements under the Project's components will follow the regular IPF disbursement mechanisms by which the PMU will make payments for the procurement of goods, works, consulting services, non-consulting services, operating costs and training, a portion of disbursements under Subcomponents 1.1; 2.3 and 2.4 will follow specific flow of funds disbursement arrangements as described further below.

30. The following table shows the Project's component names, activities comprised under each component and allocated amount.

[48] The targeted producers were selected given (a) the considerable risks that they pose for contaminating water courses with effluent run-off, making them a critical part of efforts to improve the agroecology of the Cuenca Santa Lucia watershed, (b) their smaller size (fewer than 300 cows) and limited ability to finance upfront investments in effluent management improvements, relative to other farms in the watershed; and (c) these are the remaining farms to complete the implementation of these measures in the watershed.

[49] Of the 200 farmers prioritized under this subcomponent, 75 percent will be overseen by CONAPROLE and 25 will be overseen by INALE. This is in accordance with where producers' milk is remitted.

Table A1.3: Project Costs and Financing

Project Components	IBRD Project Costs (US$)	Counterpart Project Costs (US$)	Total Project Costs (US$)
1. Strengthening Decision Support Systems for Climate Resilience. The component is composed by six activities: -Strengthening and expanding agriculture traceability systems -Management and monitoring of agricultural chemicals -Strengthening of the Natural Resources Management System (NRMS) -Enhancing agriculture risk management mechanisms and developing risk transfer solutions -Generation of environmental and agricultural indicators and tracking -Improving access of female farmers to decision support systems	**21,258,946**	**9,000,000** Government 3,000,000 beneficiaries 6,000,000[50]	**30, 258,946**
2. Supporting a Transition to Agroecological Production	**11,502,393**	**9,700,000**	**19,502,393**
2.1 Development of a strategy to define the territorial transition to agroecology	-	7,400,000	-
2.2. Strengthening the National Institute for Animal Welfare (INBA)	-	1,400,000	-
2.3 Support to develop and implement a farm-level model for agro-ecological production in Uruguay	-	Beneficiaries 300,000	-
2.4 Support for agro-ecological watershed management in Santa Lucia Watershed	-	Beneficiaries 300,000	-
3. Project Management	**2,738,661**	**-**	**2,738,661**
4. CERC	**0**	**-**	**0**
Total Project Costs	**35,500,000**	**18,700,000**	**52,500,000**

31. The type of activities and eligible expenditures to be financed under the Project are as follows:

32. **Participation of Departmental Governments (*Intendencias*) under Component 1.** (**IBRD US$ 2.88 million allocation).** MGAP's intention is to identify and register (electronic tagging) approximately 500,000 pets through the provision of non-consulting services provided by the *Intendencias*. Force Accounts Agreements will be signed between MGAP and the selected *Intendencias* (there are 19, one in each of the country's departments), and included in the procurement plan. According to the provisions to be included in the Agreements, advances will be made to the *Intendencias* based on the verification of the number of pets tagged and registered in the traceability system (*Registro Nacional de Animales de Compañía*, or RENAC) which will produce periodic reports on the progress of the expected milestones. A unit price of US$4 per pet will be considered (if the unit price needs to be reviewed and adjusted during the life of the Project, an amendment of the Force Account Agreement will be required). The *Intendencias*'s will be required to provide proper documentation on the use of funds advanced. In this regard, reports with the incurred actual costs will be submitted by each *Intendencia* to the PMU and then to the Bank through a customized SOE on a bi-annual basis. The payment procedures and supporting documentation required by the PMU will be included in the Force Account Agreements. With the purpose of ensuring the *Intendencias* have the required administrative capacity to receive and then track and report back on the actual use of funds, a simplified assessment of the *Intendencias* will be performed by the PMU, to confirm: there are adequate administrative staff at the *Intendencias* with specific focal points nominated; adequate procedures for receiving and recording on the use of the funds; procedures to retain proper supporting documentation evidencing actual expenditures for all amounts spent and to refund any unused funds if needed. These requirements will also be included/specified in the Force Accounts Agreements to be signed.

[50] Under Component 1, the project will help to promote a weather index insurance product that will cover 300 thousand ha of land and benefit at least 200 producers a year, with a total goal of 250 producers over the life of the project, leveraging a total of US$6 million in private capital from the producers.

33. **Subprojects under Subcomponent 2.3. (IBRD US$ 2.8 million allocation).** Agroecological interventions will be financed with Bank support through the preparation matching grants and subproject matching grants made to eligible beneficiaries[4] composed by family farmers producers or group/associations of farms under the agreements to be entered into between MGAP and each beneficiary on terms and conditions satisfactory to the Bank. Under the preparation matching grants and subprojects matching grants expenditure category, beneficiaries could use grant proceeds received on a US$ Lump-Sum basis to partially finance goods, consulting' services and non-consulting services under the agreements. 140 subprojects reaching 700 producers are envisioned with a maximum of US$16,000 per farm or US$80,000 per group/association (with a counterpart funding of 20 percent in case of family farmers or 50 percent in case of medium-sized farms). Agroecological interventions will be implemented by technical supervision of DGDR and fiduciary support from the PMU. Grant funds will be disbursed as per provisions included in the agreements, based on documented expenditures, and following procedures included in the OM. A customized SOE will be used by the PMU for documentation purposes. The recipients will have to submit supporting documentation evidencing actual expenditures for all amounts spent and refund any unused funds before the subproject will be considered as ''closed'' from a fiduciary perspective. All subproject activities will also need to be completed before the Closing Date to be considered eligible. The PMU will document, and the Bank will record the expenditure in the loan account at the time of transferring funds to the eligible beneficiaries (i.e., lump sum method) as there are adequate oversight arrangements in place to ensure that the funds are ultimately used for their intended purposes. The PMU will submit as part of the IFRs a report identifying the status of amounts transferred but noy yet documented.

34. **CONAPROLE and INALE implementing organizations under Subcomponent 2.4.** (**IBRD US$ 3.2 million allocation).** The implementation of the subproject scheme in the Santa Lucia Basin will be supported by CONAPROLE and INALE. For this purpose, MGAP will enter into Subsidiary Agreements with CONAPROLE and INALE, relying on their technical and fiduciary capacities for the preparation, monitoring, purchases, and payments of goods under the subprojects, under the technical leadership of DGRN in collaboration with the Ministry of Environment and fiduciary monitoring by the PMU. Subproject Agreements will be signed with the eligible beneficiaries. This subcomponent will finance the procurement of goods, works, consulting services, non-consulting services.

35. **Contingent Emergency Response - Component 4.** This component will finance eligible expenditures required to immediate response to an Eligible Crisis or Emergency in Uruguay. The list of eligible expenditures and the funds flow arrangements will be defined in the Contingency Emergency Response Manual (CER Manual) that will be adopted and will be included as part of the POM. The implementation agency for this CERC will be determined in accordance with a CERC Manual to be developed in case of an emergency. If an entity other than the PMU leads the emergency response, we would need to conduct a FM assessment of said entity, prior to funds under this component being disbursed.

36. The table below shows the overall arrangements for disbursements.

Table A1.4: Disbursement Arrangements

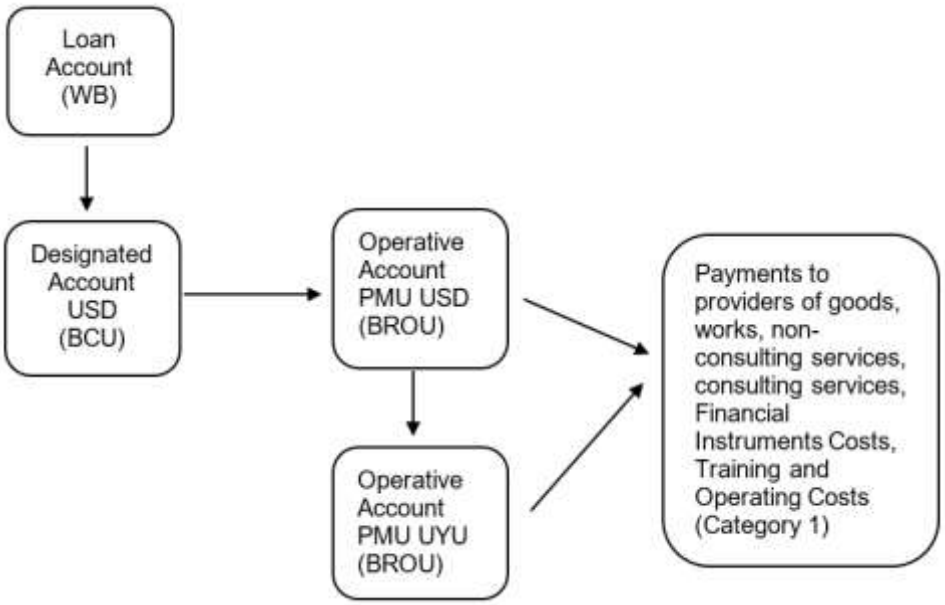
Retroactive expenditures	Eligible expenditures: ▪ Are paid on or after April 1, 2021 and prior to the Signature Date of the Loan Agreement; and ▪ Do not exceed 20 percent of the loan amount (US$ 7.1 million equivalent).
Reimbursement of eligible expenditures pre financed by the Government after the date of loan	▪ Reimbursement of eligible expenditures.

signing	
Other Disbursement Methods	▪ Advance to a segregated DA in US Dollars managed by PMU with a proposed ceiling of US$ 5 million. ▪ Direct Payments to suppliers. The Minimum Application Size for Direct Payment requests will be defined in the Disbursement and Financial Information Letter (DFIL).
Frequency of reporting expenditures paid from the DA	▪ Once every three (3) months.
Supporting documentation	▪ Statement of Expenditures (SOEs). ▪ Customized SOE for the eligible expenditures under Subcomponent 2.3 and non-consulting services provided by *Intendencias*. ▪ Records (supplier contracts, invoices, and receipts) for Direct Payments.

37. **Retroactive Financing.** No withdrawal shall be made for payments made prior to the Signature Date of the Loan Agreement, except that withdrawals up to an aggregate amount not to exceed US$ 7.1 million equivalent may be made for payments made prior to this date but on or after April 1, 2021. Such funds will be deposited in a separate bank account (not the DA).

38. The following figure presents the flow of funds:

Figure A1.1 – General Flow of Funds



39. **Specific flow of funds.** The following figures present the flow of funds under specific subcomponents:

Figure A1.2 – Flow of Funds under the Component 1, Activity related to Pet Traceability

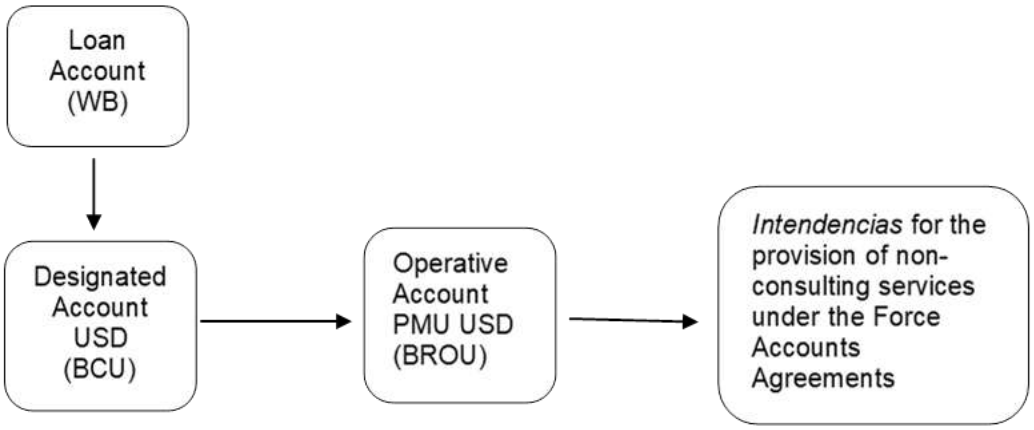


Figure A1.3 – Flow of Funds under the subprojects scheme Subcomponent 2.3.

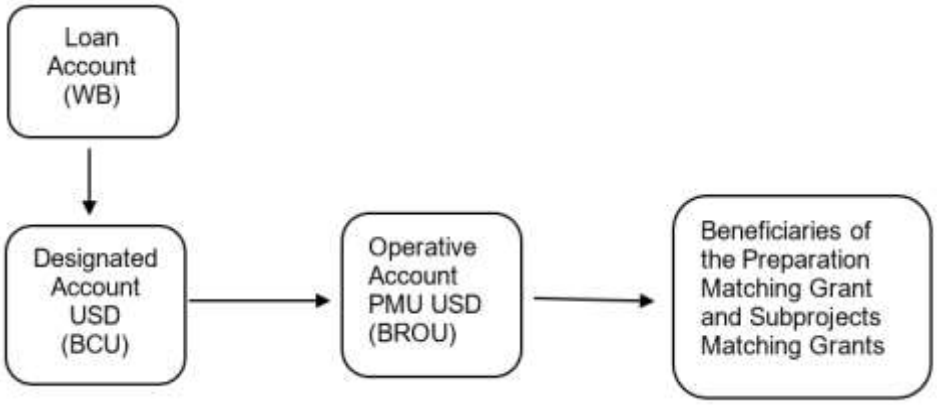
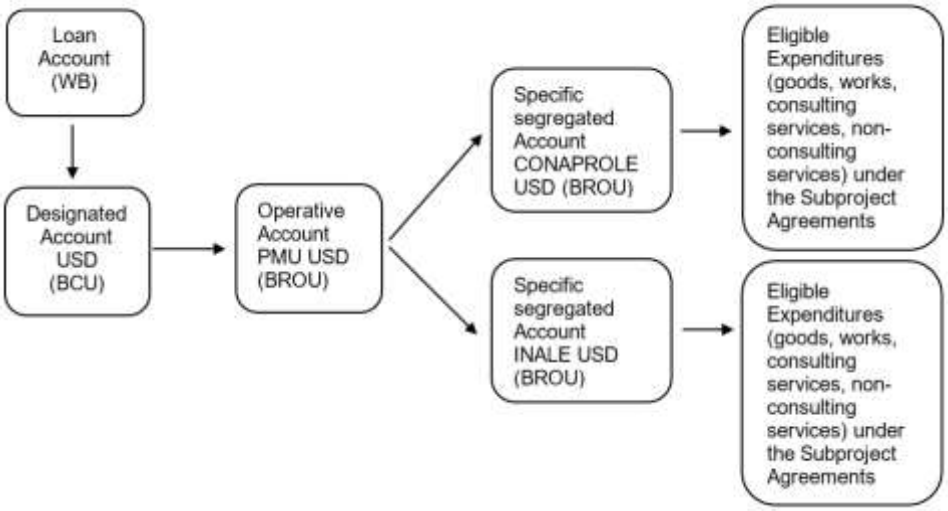


Figure A1.4 – Flow of Funds under the subprojects scheme Subcomponent 2.4



40. **FM Risk.** The overall FM residual risk after mitigating measures is assessed as Moderate. The combined fiduciary risk is rated as Moderate. The FMA identified the following risks to the achievement of the Project

Development Objective: (a) subproject schemes' complexity; and (b) close coordination that will be required between the PMU and the organizations involved in the subprojects' implementation. The following specific mitigating measures will be implemented to cope with the identified risks: (a) MGAP will enter into subsidiary agreements with both CONAPROLE and INALE to implement the subproject scheme under Subcomponent 2.4 which will detail their obligations under the Project (reflected as a disbursement condition; (b) specific flow of funds, disbursement arrangements and internal control procedures will be used under the subproject scheme; (c) preparation of an POM including a section with FM arrangements (reflected as a project effectiveness condition); (d) annual audit of the Project's financial statements following auditing standards and Terms of Reference (TOR) acceptable to the Bank; and (e) continued close Bank support and supervision.

41. **FM implementation support will include on-site and off-site supervisions.** On site missions will be carried out at least once a year and later calibrated following assessed risk and project performance. In case of lack of physical access once implementation begins, virtual FM implementation support monitoring will be conducted using ICT tools. Off-site implementation support will comprise: (a) the reviews of interim financial reports; (b) the review of audited financial statements and follow up of issues raised by auditors in the management letter, as appropriate; (c) follow up on any financial reporting and disbursement issues; and (d) ongoing guidance to the PMU on FM-related matters.

Procurement

42. Procurement will be conducted following the Bank's 'Procurement Regulations for IPF Borrowers', issued in July 2016 and updated in November 2020, for the supply of goods, works, non-consulting and consulting services. For Open International Competitive Procurement, the Bank Standard Procurement Documents will be used. For National Open Competitive Procurement, the Borrower may use documents previously agreed with the Bank. For each contract to be financed by the Loan, the different procurement or consultant selection methods, the estimated costs, prior review requirements, and time frame will be agreed between the Borrower and the Bank and reflected in the Procurement Plan. The Plan will be registered in the Systematic Tracking of Exchanges in Procurement (STEP) prior to process implementation. The Procurement Plan will be updated at least once a year, or as required to reflect actual project implementation needs and improvements in institutional capacity.

43. A procurement capacity assessment of the PMU at MGAP was carried out by the Bank to review the organizational structure for implementing the Project, and the experience of the existing procurement staff. As a result, it was concluded that the current staff in the unit counts on experience implementing Bank's financed projects and particularly on the type of procurement expected under the project, based on the knowledge from previous Bank-financed operations. Procurement capacity assessments of CONAPROLE and INALE have also been conducted considering they will be implementing part of the activities foreseen under Component 2.4. For both entities, PROLESA (CONAPROLE) and INALE, simplified documents will be developed to simplify the implementation of procurement processes to be conducted following the Procurement Regulations from the Bank. These arrangements are further analyzed in the Project Procurement Strategy for Development (PPSD) prepared by the PMU and will be reflected in the Procurement Plan in STEP. The implementation arrangements for the implementing entities, as well as its monitoring, will be addressed in the POM.

44. Based on the results of the capacity assessments conducted, the following actions are recommended to mitigate the procurement risks as identified in the Procurement Risk Assessment and Performance Report (May 2021) and facilitate project implementation: (a) for the PMU, it would be recommended to strengthen the procurement team with an additional procurement staff; (b) the implementation arrangements for the

subprojects should be clearly defined in the POM, in particular the arrangements for the implementation of Subcomponents 2.3 and 2.4, and for the procurement activities to be implemented by PROLESA and INALE; (c) simplified documents agreed with the Bank should be developed to support INALE and PROLESA in the implementation of said procurement activities, and (d) after an assessment conducted by the Bank, the use of the National Procurement System (SICE) has been approved to be used for the publication of the procurement processes (opportunities and information on the award of contracts) and, eventually, for the receipt of offers and quotations.

45. The PMU has prepared a PPSD using a short form considering the scope of the foreseen procurement activities. The PPSD includes the activities to be implemented by PROLESA and INALE and identifies the most suitable procurement arrangements to manage these processes while efficiently achieving the expected outcomes. Most procurement processes are low risk and low value, and the PPSD has considered lessons learnt from the ongoing operation to define the most suitable procurement arrangements. Such processes include the procurement of goods through Requests for Bids with an International Approach for the acquisition of microchips, as well as the procurement of goods (such as IT equipment) and non-consulting services through Request for Bids and Requests for Quotations with a National Approach; the selection of consultancy services (for both individuals and firms, such as the consultancy to be directly contracted to INIA for the development of an agro-ecological transition design); the contracting of minor works (such as wells, tanks, and pools) is also expected to be executed by PROLESA and INALE for the implementation of subprojects in the Saint Lucia Basin, which are being planned to be managed through Request for Quotations with a national market approach.

46. Agreements will be signed with Municipalities under Force Accounts Arrangements to provide non-consulting services for the identification and registration of pets. The Municipalities have been selected given their capacity to provide such services at the subnational level and in the scale foreseen (approximately 500.000 domestic animals to be identified and registered in the national registry). Interinstitutional Agreements will also be signed with INEFOP and CEIBAL to provide non-consulting services and related technical assistance to support the access of female farmers to decision support systems and associated literacy support under Component 1. After a market research analysis conducted by the Ministry, non-consultancy services are also foreseen to be procured through an advanced direct contracting of the 28 risk aggregators identified to collect, validate, and transfer data to MGAP´s centralized information system, and create an online risk management system.

47. The PMU will reflect the activities derived from the PPSD in a Procurement Plan in STEP System for the activities expected to be carried out during the first 18 months of the Project. Both the PPSD and the Procurement Plan for the Project will be updated regularly during Project implementation, in accordance with the needs identified. Based on the above, the overall project risk for procurement is Moderate.

IMPLEMENTATION SUPPORT PLAN

48. Implementation support will be provided through short follow-up technical meetings and semiannual supervision missions that focus on the following areas:

a) **Strategic support**. Bank's supervision missions will meet with MGAP representatives to (a) review progress on the Project's activities; (b) discuss strategic alignment of the Project's different activities, especially at the planning level between the relevant stakeholders; and (c) evaluate progress on cross-cutting issues such as M&E (baseline and design and execution of impact evaluation), training, communication, knowledge exchange, innovation, dissemination of Project results and experiences, and coordination between relevant stakeholders.

b) **Technical support**. Supervision will concentrate on ensuring the technical quality of investment subprojects under Component 3. For all project activities supervision will ensure the quality of bidding documents, Terms of References (ToR), evaluation reports, construction plans, products delivered by consultants. During the execution of investments, technical supervision will be provided to ensure that technical contractual obligations are met. Regular site visits will be carried out during project implementation and involve technical specialists as needed.

c) **Fiduciary support**. Formal fiduciary supervision missions will be conducted at least once or twice per year throughout the project's lifespan to (a) perform desk reviews of project IFRs and audit reports, following up on any issues raised by auditors, as appropriate; (b) assess the performance of control systems and arrangements; (c) update the procurement and FM rating in the Implementation Support and Status Report as needed; (d) provide training and guidance on carrying out procurement processes in compliance with the Procurement Regulations and Anti-Corruption Guidelines and the POM; (e) review procurement documents where applicable and provide timely feedback to the PMU; (f) carry out the post review of the corresponding procurement activities; and (g) help monitor project's progress against the Procurement Plan. In addition, the core team is expected to have regular contact with project counterparts through call/video conferences.

d) **Procurement support**. During procurement post reviews and/or project supervision, procurement will review the implementation of agreed arrangements and performance metrics, identify corrective and/or mitigative actions if necessary and monitor the procurement risk and procurement performance ratings. The Project will be closely monitored and supported with the aim of ensuring that the procurement arrangements are working as intended and the Procurement Regulations are adhered to. Procurement post reviews are expected to take place on an annual basis.

e) **Environmental and social support**. During project implementation support and supervision missions, the Bank will review the implementation of the agreed upon actions and measures set out in the ESCP, including without limitation, the management of Project related grievances, the implementation of stakeholder engagement activities, the implementation of the ESMF and SEP, as well as the Borrower's compliance with applicable relevant labor laws for purposes of managing labor related risks of the project, in line with ESS2 and the ESCP. The project will be closely monitored by the Bank via virtual and field missions (once COVID19 conditions allow), which are expected to take place at least twice a year.

Table A1.5: Implementation Support Resource Estimates

Time	Activity	Skills Needed	Resource Estimates
Year 1	- Baseline studies - Refine and finalize strategic studies and detailed plan for project activities. - Recruitment/reallocation of additional staff to initiate project's activities. - Initiate promotion and dissemination campaigns. - Refine market studies to identify targeted beneficiaries under components and scope of call for proposals. - Preparing ToRs for technical assistance and bidding documents for major processes (computerized systems, works, equipment of key MGAP's agencies, etc.). - Negotiations and singing of Agreements with related agencies and autarchic institutions in the agricultural sector and Departmental Governments (Intendencias Departamentales). - Identify additional gaps in technical assistance and needs for additional institutional strengthening efforts.	- Project management - Agricultural, climate change, value chains. - Safeguards management - Fiduciary management - Monitoring and evaluation	- at least 2 yearly support missions, one with full Task Team - support from CMU office at the technical, safeguards and fiduciary aspects

	- Carrying out calls for proposals after effectiveness.		
Year 2-5	- Full project implementation. - Call for proposals, reception, and assessment of proposals. - Approval and financing of selected proposals. - Implementation of subprojects. - Social and environmental monitoring and management. - Fiduciary (FM review and supervision of procurement bidding documents /processes and consultant contracts) - Full implementation of Monitoring and evaluation system.	- Project management - Agricultural, climate change, water, and sanitation expertise - Safeguards management - Fiduciary management - M&E	- 2 yearly support missions, one with full Task Team - support from country office at the technical, safeguards and fiduciary levels
Year 6	- Completion of all subprojects - Monitoring and evaluation - Final Evaluation and Reporting	- Project management - Technical quality - Monitoring and evaluation	- 2 support missions, one with full Task Team

Table A1.6: Skill Mix Requirements

Skill Needs for Supervision	Origin	Estimated Staff Weeks
Task team leaders	Headquarters and country based	10 per year
Agricultural smart technologies and practices	Headquarters and country based	5 per year
Agroecology and international markets	Headquarters and country based	4 per year
Agricultural economists	Headquarters and country based	5 per year
FM specialist	CMU based	4 per year
Procurement specialist	CMU based	4 per year
Social specialist	CMU based	4 per year
Environmental specialist	Country Based	4 per year
M&E specialists	Headquarters/country based	6 per year
Operations analyst	Country based	6 per year
Lawyers	CMU based	4 for project lifecycle
Disbursement officers	Headquarters/country based	2 per year

Annex 2: Detailed Project Description

Strategic Approach

1. **Because agriculture dominates Uruguay's exports, the agriculture sector must remain environmentally sustainable, climate-resilient, and globally competitive, as well as supported and regulated by public institutions that can adapt to evolving market requirements.** The successful development of high-quality products has allowed Uruguay to access high-value and differentiated markets in North America, East Asia, and Western Europe, but implied intensive resource use and risks to soil, water, human health, and biodiversity. Uruguay has emphasized intensification of production with a strong commitment to environmental sustainability, focusing actions towards an agro-ecological transition, where the challenge becomes how to enhance innovation and reconcile high demand with a low overall agricultural footprint. Uruguay's proposed way to do this is through leveraging public goods to capitalize on investments in natural resource management. Systems developed under the Project will allow the monitoring of natural resources use and compliance with regulations, as well as to generate the data necessary to develop and promote the adoption of risk prevention, transfer, and mitigation strategies in the agriculture sector, strengthening preparedness and response actions to agricultural emergencies.

2. **Given that Uruguay's economic development depends largely on the growth of exports, the demands of consumers from countries with greater purchasing power defines the direction of production and determines the characteristics of the products to be offered.** It is mandatory for Uruguay not only to provide good quality and safe products to the world (e.g., beef, lamb, and wool), but also to project an image of a sustainable attention to phytosanitary considerations and animal welfare, complying with the highest quality standards in products and processes. This path towards adding value means having a systemic look at livestock production systems, where human and animal welfare are linked through the ecosystems in which they coexist, therefore, contributing to human health, safety, and food security.

3. **The preparation of the National Agroecology Strategy will develop new technologies and the associated demonstration sites will help accelerate the transition from a linear agricultural economy to a circular economy, diversifying, greening, and reducing emissions in the supply of agricultural products differentiated by their environmental services.** Uruguay has been transitioning towards an agro-ecological model and gradually more elements must be joined together as part of a push toward institutional strengthening. With this framework, the GoU intends to advance in the lines of research on agro-ecological transitions in strategic sectors, as well as to promote territorial actions that promote technologies and structural changes for the adoption of sustainable practices that regenerate ecosystems.

4. **Consistent with this strategic approach, the project is designed to strengthen the capacities of MGAP and other key actors, to coordinate the design and execution of key policies in climate change, including adaptation and mitigation, agriculture risk management, agricultural product traceability, and agroecology**. Each of the subcomponents will provide capacity building to MGAP and sector actors to execute its programs and fulfill its role as leader in the coordination of these strategies with other public sector actors working in agriculture and to provide better public services to producers. This higher-level objective will be increasing the sustainability, resilience, and competitiveness of Uruguay's agricultural production in global markets.

Project Components

5. **Component 1: Strengthening Decision Support Systems for Climate Resilience (IBRD US$ 21.2 million; GoU US$ 3 million; Beneficiaries US$6 million).** This component will contribute to MGAP's broader efforts to achieve sustainable intensification and increased climate change resilience and agriculture risk management, through better information tools and systems for public and private decision making, as well as to reduce production risks through the improvement of existing agricultural insurance products and promotion of new insurance services offered to producers. The investments under this component will complement Government-own activities to achieve a framework for climate-related decision-making. It will focus on creating and strengthening public goods for climate resilience in the agriculture sector, with a particular emphasis on strengthening capacities for policy formulation, implementation and evaluation related to the carbon balance in production, water quality and quantity, climate risk assessment, agriculture insurance and adoption of strategies of climate risk management by producers. This component will rely on the leadership of MGAP's SNIA and SNIG teams to consolidate and reinforce existing digital platforms and develop additional digital tools for better public and private sector decision making. DGRN is responsible for the development of the IT platform. The component includes several interrelated activities as described below.

6. **Strengthening and Expanding agriculture traceability systems.** This activity, under the technical leadership of MGAP's team responsible for the National Agriculture Information System (SNIA for its Spanish acronym), will support the strengthening and expansion of the existing digital traceability systems, including the design and establishment of a system allowing the registration of veterinary and phytosanitary products, the recommendation for their use, the registration of their sale, and the final disposal of packaging of said products, which it will be integrated into the SNIA. This activity will also work to integrate existing traceability systems, including the National System of Livestock Information[51] (SNIG for its Spanish acronym), the Phytosanitary Applications Management and Monitoring[52] (DMA) system for agricultural chemicals (below), the National Registry of Pets (RENAC)[53] and the Animal Health Information System for animal health. Key outputs will include: (a) the design and establishment of a system (to be integrated into SNIA) allowing the registration of veterinary and phytosanitary products, the recommendation for their use and the final disposal of packaging; and (b) development of a national-level system for full registration and traceability of RENAC. These outputs will contribute to enhance environmental sustainability and will provide stronger and more robust support to the adoption of new technologies which are essential for increased competitiveness and for mitigation and adaptation to climate change. Additionally, the Project will support the maintenance of the existing Livestock Information System (SNIG) infrastructure to uphold the traceability standards achieved to date.

7. Specific work on the RENAC system will support registration of pets and establishing a traceability system, inserting microchips in pet dogs (as a priority) and later other pets, together with the development of a national-level system for uploading all microchipped pets in a national registry for full traceability. Law 18.471 article 18 (2009) created the mandate for the RENAC, stipulating that all pets should be registered according to the standard under the National Honorary Animal Welfare Commission. This activity is a critical element in the concept of "responsible ownership", helping in the definition of a new relationship of coexistence with pets within the context of agro-ecological production (complemented with sanitary requirements, reproductive control

[51] Uruguay has created the *Sistema Nacional de Información Ganadera* (SNIG, in Spanish), a multipurpose system that gives support to operational and strategic decisions for this important branch of the economy. It was originally developed for full traceability of beef and dairy livestock, with the idea to be expanded to other species.

[52] The Phytosanitary Applications Management and Monitoring System (DMA), started in 2019, is part of the following MGAP strategic pillars: a) Promotion of competitiveness and international integration; b) Productive intensification with economic, environmental and social sustainability; c) Adaptation and mitigation to Climate Change; d) Promotion of competitiveness and international insertion; e) Productive intensification with economic, environmental and social sustainability; f) Adaptation and mitigation to Climate Change; g) Articulation of public and public-private institutions; h) Promotion of Agricultural Awareness; i) Articulation of public and public-private institutions; j) Promotion of Agricultural Awareness.

[53] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/politicas-y-gestion/registro-nacional-animales-compania-renac

programs, and shelters for responsible adoptions[54]) and consistent with the One Health concept. Given the negative economic impacts of feral and stray dogs on agriculture production (more significant on sheep producers, but also affecting other livestock producers - see Project Files), as well as in health risks to humans and damages to property, this activity will also contribute to the economic wellbeing of livestock farmers and the population in general through the enforcing a "responsible ownership" that would establish sanctions (monetary fees of other types of sanctions) to owners of animals identified as responsible for attacks and damages to animals, humans, or property. When animals causing damages are identified and without a registered owner, they would be reallocated to animal shelters (carried out by the Borrower outside the Project) and considered for adoption.

8. This activity will support: (a) acquisition of goods required for the registration of pets (computer equipment, microchips, and other materials); and (b) the identification and registration of these pets in the national registry. This activity will be implemented through a Force Accounts Agreement between MAGAP and the Departmental Governments (*Intendencias Departamentales*), in the country's 19 departments. These *Intendencias* will coordinate the insertion of microchips in these pets and the uploading of information into the digital system by paying professional fees to Qualified Operators (mostly local Veterinary Doctors or other professionals, duly certified and who are in contact with pet owners, who are registered in the *Intendencias*) in their territories.

9. During the first year of the project MGAP will undertake an impact analysis to quantify the negative economic impact of pets on agricultural production. Workshops will be undertaken to develop the national strategy for a traceability system with various key actors (see Project files for other international experiences and their contributions to agriculture). Complementing this activity, the Project will support a national dissemination and training campaign, targeted to improve awareness, and increase capacity of different key actors in the implementation of the national strategy.

10. **Management and Monitoring of Agricultural Chemicals (DMA).** This tool was piloted under the DACC project in 2018 and is now poised for further scaling up. The activity will specifically invest in: (a) development of the platform's interface to improve databases and data layers[55]; (b) integration of the DMA system with the DGRN's Soil Use and Management Plans program; (c) development of a phone-based application for the Registration of Applications; (d) design and implementation of programs for training, inspection and qualification, and a communication and dissemination plan; (e) definition of protocols and development of a DMA system manual; and (f) purchase of GPS-enabled electronic monitors to connect the pesticide applicators to central databases. All these activities will directly impact international competitiveness, contributing to efforts to mitigation and adaptation to climate change.

11. **Strengthening the Natural Resources Management System (NRMS).** The NRMS will support the tracking of information related to natural resource management and aggregate information to generate natural resource management-specific indicators. The activity will also invest in the generation and collection of associated data for the integrated monitoring, evaluation, and development of public policies of natural resources and provide public information related to natural resources use and management, with a particular emphasis on soil resources. To do this, it will support (a) expanded soil mapping for the entire country as an additional tool for natural resources management. Under the DACC project, the total mapped area of Uruguay at scale 1:40,000 was

[54] For information on additional measures, please check COTRYBA's National program on management of dog population: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/documentos/noticias/programa_nacional_de_gestion_de_la_problacion_canina_en_uruguay_consejo_consultivo_-_cotryba.pdf

[55] Data including layers of buffer zones (populated centers, rural schools, apiaries, water courses, protected areas), phytosanitary application polygons, conflict management, phytosanitary application records, management of professional recipes, complaints, requests for exemption of applications near rural schools.

increased to 45 percent and, the area covered under this Project is expected to reach 75 percent of the country's area, completing the soil mapping of the area considered to be suitable for intensive arable use (which is one of the essential tools supporting planning and natural resources use management, as well as traceability systems); (b) development of a platform and additional remote sensing capacity to increase the Government's ability to remotely monitor the use of natural resources, and specifically the adherence to the mandated soil use and management plans, whose benefits have been documented extensively.[56] These actions are essential to support adoption of new technologies, as well as the capacity to design public policies and to monitor their implementation, all contributing to mitigation and adaptation to climate change.

12. **Enhancing agriculture risk management mechanisms and developing risk transfer solutions**.[57] The activity will be under technical leadership by MGAP´s OPYPA in collaboration with SNIA team. It will cover the following:

a) The strengthening of OPYPA's capacity to generate and systematize information related to the impact of extreme climatic events on the agricultural sector, and thereby improving loss-assessment and decision-making mechanisms to design risk management policies. SNIA will create an online module for a risk management system, which will include agroclimatic data and production data. This is for the design of risk management policies and decision making across the sector – including, among others, OPYPA, and DGRN. Based on the guidelines on conducting a post-disaster need assessment for extreme weather events, the project will develop tools to standardize loss and/or damage data registry, data submission and reporting at different administrative levels (i.e., department level, regional level, national level) . The project will also evaluate, in collaboration with the Uruguayan Institute of Meteorology (INUMET), the most appropriate density of meteorological stations into the national meteorological network, and the required combination of data to improve the assessment and monitoring of climatic risks in productive areas.
b) Under the technical leadership of OPYPA, the project will finance the design and implementation of an information module to monitor agriculture insurance policies supported under MGAP´s programs. In order to do this, MGAP will pilot data collection among producers through Aggregators to generate a geo-reference agricultural database for rainfed crops (maize, sorghum, wheat, barley, soybean, and canola). These databases will support insurance policies of these crops, covering an estimated total area of 300,000 hectares. This pilot program will collect, validate, and disseminating agricultural data to improve the design of selected agriculture insurance products, new risk transfer instruments (either indemnity-based or parametric instruments) and excess of loss reinsurance protection. This will also help structure a risk financing strategy for the country's agricultural sector enabling aggregators or individual producers to transfer risks to international markets or obtain liquidity to respond to specific risks.
c) The development and implementation of a governance mechanism among MGAPs units and associated institutions to improve their capacity of agricultural risk management, thereby reducing the impacts of natural hazards on the agricultural sector. This will be implemented through vulnerability and risk assessments, the elaboration of an integrated agricultural risk management plan and a communication strategy for public awareness and advocacy.

13. **Generation of Environmental and Agriculture Indicators and Tracking system.** These activities under the component will be under the technical leadership of OPYPA's climate change unit focusing on improving capacity for tracking the agriculture sector's impact on natural resources and tracking indicators towards better reporting

[56] The benefits of the soil use and management plans have been documented extensively by Uruguayan academics as well as the Ministry's own economists. One prominent paper is: 1) *https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/noticias/estimacion-del-impacto-pumrs-reduccion-perdidas-suelos-erosion-hidrica and 2*)

[57] Agriculture insurance products transfer the damages caused, among others, by extreme weather events, thereby improving stakeholders´ (i.e., farmers, organized groups of producers) resilience against shocks. Under the DACC project, a joint pilot on weather index micro-insurance for livestock producers demonstrated the successful transfer of risks.

of Uruguay's contributions to the Paris Agreement, through innovative work on environmental accounting, generation of a National GHG Inventory and developing a better se of environmental indicators related to mitigation and adaptation. The activity will also include economic analysis and impact evaluation of MGAP programs, as well as biodiversity and diversification metrics.

14. **Improving access of female farmers to decision support systems**. This activity will be under the technical leadership of the DGDR and will directly contract INEFOP to provide non-consulting services of training for women. It will pilot the provision of digital devices (tablets or notebooks) to female farmers and accompany this with digital literacy support. It will help female farmers to access MGAP systems and to information on climate adaptation tools and strategies. Leveraging learnings from Uruguay's "*Plan Ceibal*"[58], this pilot will give approximately 2,000 tablets / notebooks to female agricultural producers and accompany these devices with technical assistance provided by MGAP's technicians to support female farmers in accessing and using information on MGAP platforms (including digital literacy). Following the successful pilot phase supported by the Project, MGAP expects to scale up the program with its own budgetary resources to expand female farmers access to agricultural information.

15. **Component 2: Supporting a Transition to Agro-ecological Production (IBRD US$11.6 million, Government of Uruguay US$8 million).** The objective of Component 2 is to contribute to MGAP's broader efforts to transition its agri-food sector towards one based on agro-ecological principles, increasing competitiveness, employing a "One Health" approach,[59] and contributing to fundamental aspects of climate change resilience and mitigation in the sector through all four subcomponents. Along these lines, Component 2 will finance (a) consulting and non-consulting services to support key, strategic institutional strengthening and policy development activities in support of Uruguay's agro-ecological transition (subcomponents 1 and 2), (b) goods, small works, services, training, and technical assistance for the selection, preparation, and implementation of agroecology subprojects and design of a national characterization or/and certification model for agro-ecological production (subcomponent 3); (c) matching grant incentives to co-finance the implementation of agroecology subprojects (subcomponent 3); and (d) support to agro-ecological watershed management in Cuenca Santa Lucia (subcomponent 4). These investments will capitalize on the public goods under Component 1 in tracking GHG emissions and animal welfare, helping to establish branding for Uruguayan agriculture around principles of agro-ecological production focused on capturing space in higher-value markets. Component 2 will thus help to create national and international recognition for Uruguay's sustainable production with market orientation towards domestic and international consumption.

16. This component will place a particular emphasis on supporting female farmers to agro-ecological transition to address the specific barriers they face in relation to access to inputs/resources and adequate technical assistance in the sector. With the goal of increasing female-led farms agribusiness's resilience and the potential for leveraging some women-specific product branding to access higher-value and specialized markets, the component will include improve information outreach to equal access to project opportunities, adopt measures in the selection processes and eligibility criteria giving special priority to women-led and tailor capacity building activities to cover implementation of practices and technology management meeting women's needs. The component will include four subcomponents:

[58] Plan Ceibal provides laptops to all school children and retired people. *https://www.ceibal.edu.uy/en/institucional*

[59] "OneHealth" is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment. The OneHealth approach can be considered part of the broader Agro-ecological transition in that the promotion of animal health and welfare also contributes to human health, safety and food security. *https://www.cdc.gov/onehealth/index.html#:~:text=One percent20Health percent20is percent20a percent20collaborative,plants percent2C percent20and percent20their percent20shared percent20environment*

17. **Subcomponent 2.1: Development of a strategy to define the territorial transition to agroecology.** The aim of this subcomponent is to develop a national strategy for guiding farmers to adopt practices and technologies consistent with an agro-ecological production model. Under this subcomponent, INIA will develop an agroecology strategy for the agriculture sector in which the parameters of an on-farm agro-ecological transition will be defined, drawing on Uruguay's own research as well as research partnerships with global leaders in this area. The strategy will place a particular emphasis on female producers and targeting women to lead their own farms' transitions towards agro-ecological production. The strategy will include a list of defined technologies to potentially be included within the on-farm agro-ecological transition supported in subcomponent 2.3 and the support for watershed management in subcomponent 2.4. Technologies include effluent management technologies, soil rotation strategies, monitored use of biofertilizers, biopesticides management and incorporation of production management technologies, among others. An indicative list of technologies is included in Annex 6.

18. The subcomponent will also support the establishment of an agro-ecological Transition Committee (CTA), to be constituted as a coordination body to innovate and facilitate the implementation of the transversality of agroecology as a State policy and allowing close collaboration and communication between the different executing units of MGAP and other institutions directly involved. Its main objectives will be to define the strategy to be followed and the activities to be carried out, monitoring the progress of said strategy. This CTA will comprise: (a) a Chair to be appointed by MGAP's Minister to preside over the Committee: (b) representatives appointed by the Minister to represent other key units within MGAP (e.g., DGRD, DGRN, DGSA, PMU, and others to be specified in the POM). To ensure that the agroecology strategy leverages all of the most cutting-edge knowledge and expertise of global leaders, INIA and MGAP together will host a Policy and Innovation Advisory Roundtable focused on agroecology, including participants from the governments of other countries, as well as academic institutions and other agents, with interest and knowledge on the topic (Ireland, New Zealand, the University of Wageningen, and the Stockholm Institute seem to be clear candidates). This roundtable will serve to identify the main challenges to Uruguay's agro-ecological transition, thereby informing the identification of key solutions and approaches (e.g., priority technologies, producer typologies, approaches at different scales from plot to landscape). The roundtable will meet at least once a year to exchange on ideas and new developments related to emerging potential areas of action in agroecology (challenges, innovation, info exchanges), or as frequently as necessary.

19. **Subcomponent 2.2: Strengthening the National Institute for Animal Welfare (INBA).** This subcomponent will contribute to increasing the capacity of the INBA to comply with the Law No. 18.471 as modified by the Animal Welfare Law N° 19.889[60] to improve animal welfare standards and treatment of animals, and in the country, towards the development of an agroecology strategy. It will also support the development of a strategic National Animal Welfare Plan to support the implementation and monitoring of the Animal Welfare Law. The focus is to improve the welfare of animals, achieving a higher level of general health, incorporating new policies aimed at improving animal welfare, and reducing the risks of spreading bidirectional zoonosis, in a framework of tolerance and respect. The objective of this subcomponent is to support One Health aspects of Uruguay's agro-ecological transition through select institutional strengthening and policy development activities. This aligns with the principle that protecting animal health and welfare contributes also to human health, safety, and food security; it also links to Uruguay's commitments to producing high-quality products with exemplary production practices, including for animal welfare. To this end, this subcomponent will contribute to increasing the capacity of the National Institute for Animal Welfare (INBA) to ensure progress against standards for animal welfare and improvement of the country's treatment of animals, towards the development of an agroecology strategy. It will also support the development of a strategic National Animal Welfare Plan to support the implementation and

[60] Law N° 19889, Section VI - Agricultural Sector, Chapter V - Creation of the National Institute of Animal Welfare, Article 377

monitoring of the Animal Welfare Law. Given the need to increase awareness and understanding of animal welfare among relevant stakeholders, this subcomponent will also support the development of educational policies, plans and programs for the dissemination of good practices in animal welfare.

20. Specifically, this subcomponent will support strategy development, the implementation of animal health and welfare regulations, monitoring and evaluation capacity, information systems, research on animal welfare, and digital capacity improvement for capacity building and sustainability of INBA. The Animal Welfare Plan will be developed through a consultative process and based on a diagnostic of animal welfare nationally for animal species prioritized by the institute, e.g., cattle, sheep, horses, and other species of interest. The focus will be on improving the welfare of targeted species, incorporating new policies aimed at improving the welfare for all animals, and reducing the risks of disease spread between animals as well as among animals and humans. The subcomponent will also contribute to strengthening the capacities of MGAP to implement the Animal Welfare Law with specific emphasis on promoting responsible ownership of animals through improved traceability, consistent with the idea that protecting animal health and welfare contributes also to human health, safety, and food security, through a responsible ownership of pets. The activities under this component will complement efforts to increase international competitiveness by ensuring a clean and environmentally friendly production environment and by increasing productivity in the livestock sector through reducing losses due to animal welfare issues.

21. Acknowledging the fundamental role of the participation of women in a One Health approach, educational plans and programs will be designed with a particular emphasis on targeting women to increase their knowledge and decision-making power on-farm. In addition, the project will ensure to adequately inform female and male veterinarians on training opportunities and promote equal participation in these opportunities (e.g., information outreach through female professional networks, appropriate time, and location for trainings, etc.).

22. **Subcomponent 2.3: Support to develop and implement a farm-level model for agro-ecological production in Uruguay.** The purpose of this subcomponent is to demonstrate how a farm-level transition to agro-ecological production can be done in project targeted areas of Uruguay. This activity will fall under the technical supervision of DGNR and will achieve three subgoals. First, it will support selected producers, producer groups, and rural associations in the practical application of the agro-ecological transition as defined in the INIA-designed strategy (subcomponent 2.1) through investment in about 140 subprojects (700 farmers) in four subsectors: beef and dairy livestock, fruit and horticulture and agriculture. To support farmers in this on-farm agro-ecological transition, the subcomponent will train approximately 100 extensionists and leverage 20 Territorial Agents for Rural Development to link producer organizations with technical assistance providers and support them to apply the packages of technology promoted in the INIA-designed strategy.

23. The subprojects supported under this subcomponent would consist of inter alia: (a) fixed capital; (b) working capital and (c) technical assistance expenditure. Subproject proposals will be presented by interested farmers, groups of farmers and associations of farmers with the support of a qualified technical advisor to implement a production system incorporating agro-ecological technologies and practices promoting sustainable use of natural resources geared towards mitigation and adaptation to climate change. Eligibility criteria will ensure representation across Uruguay's *departamentos*, a minimum of 70 percent family farmers, a minimum of 30 percent women farmers, and inclusion of youth. The subprojects will be analyzed by the Evaluation Committee and the ones finally approved, will receive matching grant financing with a maximum of US$16,000 per farm or US$80,000 per group/association (with a counterpart funding of 20 percent in case of family farmers or 50 percent in case of medium-sized farms). Additionally, the Project will cover the need of technical assistance on top of the

investment grant for the implementation of the subproject (up to a maximum to be defined in the POM). Box 1 shows a summary of the proposed subproject cycle, which will be governed by procedures defined in the POM. The process will be based on the concept of Co-innovation as a participatory construction methodology of the proposals, however, within the eligibility of the producers, the following are considered as relevant aspects: 1 subproject at least per department per year, subprojects in the 4 areas that The INIA consultancy is integrated, at least 70 percent integration of the subprojects represented by family producers, at least 30 percent participation of women representatives of subprojects, the integration of young people to the proposals will be positively valued and criteria will be established in general. evaluation of the proposals that aim at comprehensive coherence with the objective of lifting restrictions identified in the diagnosis and the financed agro-ecological transition measures, especially technical assistance.

Box 1. Summary of Subproject Cycle, Component 2.3.

1. Following a project dissemination campaign to create overall awareness, interested rural producers and producer associations would define agro-ecological interventions in their respective value chains in a subproject proposal (*Perfil de Subproyecto*), which are submitted to *DGDR/PMU/MAGAP*;
2. Subproject proposals are assessed for eligibility, according to targeting criteria set forth in the POM; if deemed eligible, rural producers and producer associations are authorized to develop subproject proposals into subprojects, with technical service provision as needed and financed under the Project;
3. Subprojects are evaluated by the *Comité de Evaluación del Proyecto* (CEP) for compliance with environmental, financial, institutional, social, and technical guidelines (per the POM);
4. For CEP-approved subprojects, subproject agreements (C*onvenios*) are signed between rural producers/ producer associations and *DGDR/PMU/MGAP* to support finance of that portion of approved subproject implemented by rural producers and associations, specifying the use of subproject resources, and the rights and responsibilities of each rural producer/ producer association;
5. Subproject resources are transferred to rural producers/ producer associations for subproject execution;
6. Rural producers and producer associations contract goods works and services, in accordance with the norms established in the POM, for the implementation of the subprojects and prepare reports for DGDR/PMU/MAGAP to document the progress in implementation and the use of the resources transferred.

24. Second, this subcomponent will develop a plan of action and build capacity to advance work towards a national certification model for agro-ecological production. With the technical capacity of DIGEGRA, a characterization will be developed of the processes for registering and certifying “Agro-ecological” products. The certification model will look to the Irish model of Board Bia and Origin Green, which have a strong emphasis on the private sector. The certification processes will incorporate data aggregated using new tools developed by Components 1 and 2, with a focus on the use and monitoring of bioproducts, including biopesticides and biofertilizers for branding.

25. To advance these activities, it will be necessary to build capacity and develop tools for product registration. In Uruguay, there are regulations for growth promoters, biological controllers, and organic inputs, which include organic amendments, organic fertilizers, and organo-mineral fertilizers, but there is still a need to expand the rules for organic inputs, which should include other products such as bio stimulants and specific standards for biological phytosanitary products that arise from animal and plant matrices. At the Mercosur level there is no progress in these lines and therefore work will be done to generate a common base that can be used regionally. In recent years, there has been an important push to generate specific standards for organic certification and also work on

the concept of "integrated production", adopting it to apply it to agroecological certification. This would lower the level of risk at the environmental and health level. Specifically, it is a link that joins other tools that the Project will support, such as the PUMs, the traceability of health and veterinary products, cartography, the DMA system, and territorial actions to promote good practices in agro-ecological transition.

26. Third, this subcomponent will select between 5-10 subproject investments to showcase as demonstration sites for how a transition to agro-ecological production can be undertaken. It will arrange for farmer field days and farmer picnics where producers can participate in site visits at the demonstration farms and learn about the techniques that make up an agro-ecological transition. The demonstration sites in this manner will help to accelerate the transition from a linear agricultural economy to a circular economy, diversifying, greening, and reducing emissions in the supply of agricultural products differentiated by their environmental services. As part of these farmer field days, there will be events targeting women producers such as the organization of women-led groups to visit the demonstration sites in order to enable women learning together about the technologies and practices necessary for an agro-ecological transition.

25. **Subcomponent 2.4: Support for agro-ecological watershed management in Cuenca Santa Lucia.** The objective of this subcomponent is to continue improving water quality in Cuenca Santa Lucia through supporting adoption of manure management technologies promoted in the INIA-designed agro-ecological strategy (subcomponent 2.1). These efforts were initiated by MGAP in 2017, in collaboration with the MOE, and through agreements with the *Instituto Nacional de la Leche*[61] (INALE), and the *Cooperativa Nacional de Productores de Leche*[62] (CONAPROLE). This governmental program established that dairy farmers with more than 300 cows should carried out the investments required on their own, under the supervision of MGA and MOE, while farmers with less than 300 cows would receive technical and financial assistance from GoU, helping them cover part of the investment costs. The ongoing Bank-supported DACC project helped carrying out these plans for the smaller dairy farms, through technical assistance and subproject financing. Currently, from approximately 1,200 dairy farms in the Santa Lucia Cuenca, only about 300 smaller farms are still in the process of implementing their effluent control plans, of which about 200 are considered top priority given their potential contribution to the watershed contamination (based on their volume of effluents and their location). An article published in the *OPYPA Anuario* analyzed the impact of the subprojects supported by DACC, using tools designed specifically for Uruguay, and demonstrated the ability of these investments to reduce phosphorous run-off into the watershed, drastically reducing eutrophication.[63]

26. The subcomponent will target 200 dairy producers in the Cuenca Santa Lucia watershed to equip them with effluent management technologies to achieve on-farm circular economy through nutrient cycling. The targeted producers were selected given (a) the considerable risks that they pose for contaminating water courses with effluent run-off, making them a critical part of efforts to improve the agroecology of the Cuenca Santa Lucia watershed, (b) their smaller size (fewer than 300 cows) and limited ability to finance upfront investments in effluent management improvements, relative to other farms in the watershed; and (c) there are the remaining farms to complete the implementation of these measures in the watershed. This activity will be under the

[61] The National Milk Institute (INALE) It is a legal entity established under non-state public law (Law 18.242 of December 27, 2007), with the objective of seeking to be the axis of articulation of the public-private network, oriented to the development of the dairy sector, advising the government on dairy policy and planning the development of dairy sector.
[62] National Dairy Famer Cooperative (CONAPROLE) was created by Law 9.526 of December 14, 1935. It is now the biggest private firm and the largest exporter in Uruguay, owned by around 2,000 small and medium dairy farmers, providing fresh milk supply to about 60 percent of Montevideo's population (or around 1 million people) and a diversified array of dairy products for the national and international markets.
[63] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/anuario-opypa-2020/estudios/impacto-potencial-convocatoria-cuenca-santa

technical leadership of DGRN in collaboration with MOE, and with implementation to be carried out through subsidiary agreements with INALE and CONAPROLE-PROLESA.

27. The main benefit of the investments under this subcomponent is not at the level of the individual farm; rather, it is improved water quality within the entire Santa Lucia watershed. The support provided by this subcomponent will accordingly cover 80 percent of the investment costs for each farm, up to a limit of US$16,000 per farm. In addition to covering the remaining costs of the investment, producers will contribute operational and maintenance costs going forward.

28. Of the 200 farmers prioritized under this subcomponent, 75 percent of these remit their milk exclusively to CONAPROLE and 25 pertain to other smaller cooperatives and milk processing facilities. To accompany these investments, the project will enter into subsidiary agreements with CONAPROLE-PROLESA and INALE to execute this subcomponent according to Bank policy. The Project will help establish a CTA, chaired by MGAP and comprising all parties relevant to this activity, that will be responsible for: (a) definition of the types of effluent control plans to be implemented; (b) disseminate the objective of the activity increasing awareness in the rural population and carrying out a public announcement requesting the affected farmer to present their plan proposals; (c) selection and approval of each individual plan to be funded; and (d) supervise and monitor the implementation of all plans in the basin.

28. **Component 3: Project Management (IBRD US$2.7 million).** This component will rely on the existing Project Management Unit (PMU) seated within MGAP. This PMU is responsible for implementing and managing all programs and projects with external financing from the Ministry, thus avoiding the multiplicity of similar structures for each project, and allowing the efficient, effective, and pertinent integration of the different sources of financing and public policy actions. The PMU has in its current portfolio the Bank--supported DACC project, as well as other internationally supported projects. Component 4 will partially finance the PMU to execute the roles of fiduciary management, procurement, planning, monitoring and evaluation, training, legal and environment and social standards, complementing Uruguay's strong public sector procurement and labor legal and regulatory frameworks. This Component will also finance a baseline assessment, mid-term evaluation and end-line assessment to examine impact of the program, including differential impacts for female and male beneficiaries (the gender unit of MGAP to ensure overall implementation and monitoring of gender-related activities).

29. **Component 4: Contingent Emergency Response Component - CERC (US$0 million).** This component will be activated and funded in case an Eligible Crisis or Emergency takes place. An Eligible Crisis or Emergency is defined as "an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters." The mechanism for the triggering of the CERC will be detailed in the Loan Agreement and will include, inter alia, the preparation of a CERC Manual detailing the applicable fiduciary, environmental and social, monitoring, reporting, and any other implementation arrangements necessary for the implementation of the activities proposed to be financed. In case of an event triggering the component, a project restructuring will be processed to carry out the corresponding assessments (including the one of the relevant implementation agency), and a reallocation of funds will be introduced to the loan disbursement categories to fund the proposed activities under this component.

Annex 3: Institutions Involved in the Implementation of the Project

1. **The Ministry of Livestock, Agriculture and Fisheries (MGAP)** has an internal structure based on nine General Directorates and several specialized units. When the current administration assumed office in March 2020, the Animal Welfare Institute (INBA) was established as a centralized body, but subject to the Executive Branch supervision through MGAP. In addition, there are six institutes of public-private management linked to the agricultural sector that have sectoral or transversal functions and are supervised by Government through this Ministry. The agencies that have a direct link with the execution of the Project are described below.

2. **Directorate of Secretaries (DGS).** This Directorate is responsible for providing support for decision-making by the Minister and strategic planning and management control required for the fulfillment of the substantive tasks. Supervises actions related to the administration of assets, human and financial resources, in order to ensure efficient and effective management, aimed at optimizing the provision of services to the user.

3. **National Service of Agricultural Information (SNIA).** SNIA integrates the different information systems and registries of MGAP, articulating with its departments and the institutions linked to the agricultural sector for the exchange of information. It operates under the supervision of the DGS. SNIA is responsible for creating and maintaining the single registry of entities linked to MGAP, REUNE, which must be integrated with all existing registries in the organization. The system is conceived as a platform for the integration of different information systems, which contains data from sources on natural resource management, animal information management, plant information management, agroclimatic information linked to risk management, as well as other information provided by entities linked to the country's agricultural production. SNIA's objective is to provide information on production systems to support the definition of public policies and its evaluation, and to contribute to the development of the agricultural sector, giving visibility to society as a whole on these activities.

4. **Directorate on Rural Development (DGDR).** The DGDR was created in 2008 as an Executing Unit with a General Director appointed by the minister. DGDR is responsible for designing tailored policies for the agricultural activity, with the aim of achieving rural development with a new conception of production model, based on economic, social, and environmental sustainability and with the participation of actors in the territories. Rural development transcends the strictly agricultural field, so it constitutes in its essence an integrating effort of our entire society and its central objective is the rural population. In particular, DGDR is committed to an inclusive rural development, with active public policies towards: Rural women, rural youth, agroecology, family production, rural microcredit, public purchases, rural development roundtables, and marketing.

5. **Directorate of Natural Resources (DGRN).** DGRN is responsible for promoting the rational use and management of natural resources, in order to achieve a sustainable development of the agricultural sector and contribute to the conservation of biological diversity. The key task of DGRN are: (a) Formulate the national strategy on sustainable use and management of natural resources, and control compliance with the regulatory framework and promote and regulate the integrated and sustainable use and management of natural resources (soils, water) whose purposes are agricultural, depending on watersheds; (b) Establish, develop and maintain the Geographic Information System of natural resources and to generate the necessary information to establish the productive capacity, coordination the information available in relation to natural resources and the environmental ordering of the territory; (c) Identify and coordinate actions with national and departmental public bodies in relation to the sustainable use and management of natural resources, as well as enter into agreements with public and private, national or foreign institutions for the execution of the tasks, supervising their fulfillment.

6. **Directorate of Agricultural Services (DGSA).** Executing Unit with the role of protecting and improving the phytosanitary status, the quality and safety of vegetable products, contributing to sustainable development, agricultural trade, the preservation of the environment and the health of the population. The key tasks of DGSA are: (a) Strengthen plant protection actions at a national and international level, and develop and implement actions to improve the quality and safety of foods of plant origin and animal feed; (b) Regulate and control agricultural inputs (phytosanitary products, fertilizers and biological agents), promoting and training in responsible use and care for the environment; (c) Implement and develop the accreditation of products and processes within the scope of the DGSA's tasks and contribute to the development, implementation and application of good agricultural practices.

7. **Office of Agricultural Programming and Policy (OPYPA).** OPYPA is an organizational unit that operates across the entire MGAP. The objective of this unit is to contribute with the design, implementation, and evaluation of public policies for the productive sectors, creating enabling conditions for sustainable development. OPYPA's key tasks are: The design and proposal of long-term policies, assist in the adoption of temporary measures and corrective measures, monitor agro-industrial value chains and their economic reality, assess the policies implemented in the sector, carry out analysis and studies of transversal and sectoral issues - with emphasis on: technical change, sustainable intensification, adaptation and mitigation of climate change, risk management, coordination of production chains and competitiveness. Within OPYPA, the **Agricultural Sustainability and Climate Change Unit** aims to the promotion of sustainable intensification of agricultural production and responses to climate change and variability. Additionally, participate in the process of building the National Policy on Climate Change and at in environmental negotiations, and advance in the formulation of the Economic Environmental Accounts and promotion of the Bioeconomy and the Circular Economy.

8. **Institute of Animal Welfare (INBA).** Newly created body aimed to advise the Executive Branch on policies and programs related to its scope of action for the fulfillment of the purposes of this law and other complementary provisions; plan, organize, lead, and evaluate action programs aimed at the protection, promotion and awareness of responsible animal ownership, and coordinate plans and programs with other public bodies, being able to form or integrate commissions or working groups for this. In particular, INBA must coordinate its actions, plans and programs with the National Honorary Commission on Zoonoses of the Ministry of Public Health, the National Directorate of Livestock Services of MGAP, and the National Directorate of Environment of the Ministry of Housing and Territorial Planning. A working group will be formed between representatives of the Ministries so that their administrative activity and the Institute are coordinated and complement each other. The competence attributed to INBA does not exclude others that have been attributed to the National Honorary Commission for Animal Welfare and the National Honorary Commission for Responsible Ownership and Animal Welfare. The competence of the Institute excludes those species destined to production, industrial activities or activities related to these, which are already included in the competence framework of MGAP.

9. National Agricultural Research Institute (INIA). The objective of INIA is to generate and adapt knowledge and technologies that contributes to the sustainable development of the agricultural sector and the country, considering state policies, social inclusion and the demands of markets and consumers. The institute is over the supervision of MGAP. INIA's main tasks are: a) To formulate and execute agricultural research programs aimed at generating and adapting appropriate technologies to the needs of the country and to the socioeconomic conditions of agricultural production, b) Participate in the development of a national scientific and technological heritage in the agricultural area, through its own activity or through efficient coordination with other research programs and transfer of agricultural technology that are carried out at public or private levels, and c) articulate

an effective transfer of the technology generated with technical assistance and extension organizations that operate at public or private levels.

10. **National Milk Institute (INALE).** INALE is a non-state public law legal entity. Its main task is to advise the government on dairy policy. Its objective is to contribute to the articulation of a public-private network, oriented to the development of the dairy sector. Also, advises the government on dairy policy, articulates, and promotes relationships between agents in the dairy value chain, and coordinates actions with related public and private institutions, and generates and disseminates sectorial information, specialized studies and publications that contribute to the knowledge of the sector and to transparency in the relationship of the agents involved.

11. **National Cooperative of Milk Producers (CONAPROLE).** CONAPROLE's mission is to maximize the value of milk by providing innovative, quality, and healthy products for our customers around the world. It aims to be a leading company in Latin America with a global reach in dairy foods of excellence, generating a sustainable and positive impact on people and the environment. Among all its strategies CONAPROLE defines an environmental dimension and works permanently on the main aspects of the production-environment interrelation. Among the main areas of work, some can be highlighted: Effluent management, solid waste management, responsible use of water, rural and internal roads, shadows, energy efficiency. Productive intensification requires maintenance and readjustment of the infrastructure to the new circumstances. CONAPROLE offers technical support to its members for the design and execution of road works, milking parlors, corrals, feeding grounds, water distribution for livestock, irrigation works, and effluent and solid waste management systems.

12. **Ministry of the Environment.** Article 291 of Law 19,889 established the Ministry of the Environment as an independent Ministry, separating that portfolio from what was previously the Ministry of Housing, Land Management and Environment (MVOTMA). The mission of the aforementioned Ministry is to establish the national environmental policy, environmental management and sustainable development and the conservation and use of natural resources. This law also transfers the National Environment Directorate , and the National Water Directorate (DINAGUA) to the new Ministry. This Ministry has various Directorates that address environmental issues. They are: i) National Directorate of Quality and Environmental Assessment; ii) National Water Directorate; iii) National Directorate of Biodiversity and Ecosystem Services; and iv) National Directorate of Climate Change.

13. Key underlying plans and frameworks for the Project:

a. **National Adaptation Plan,** contributing to improving the livelihoods of rural populations through sustainable animal and plant production systems that are less vulnerable to the impacts of climate variability and change. This Plan involves a wide spectrum of actors and institutions and integrates lines of work of all the institutions of the agricultural sector.
b. **Environmental and Economic Accounting System (SCAE**), which is the UN-approved international statistical standard to incorporate the environmental dimension in the measurement of economic progress.
c. **Bioeconomy Strategy,** that aims to increase competitiveness by improving the country's position in international food markets based on the differentiating products and processes by environmental attributes.
d. **National Inventories of Greenhouse Gases,** which is one key element necessary to enhance Uruguay's reporting of National Greenhouse Gas Inventories (INGEI) to the UN Framework Convention on Climate Change Secretariat (UNFCCC).

Table A3.1. Project Contributions to Strengthening Institutions

Component 1. Strengthening Decision Support Systems for Climate Resilience

Project activities	Targeted MGAP agencies and departments	Policies to mandate the work in the sector	Existing Laws provide the basis of the work
Investment in improved data and information systems for better decision-making related to climate change, and the sustainability of natural resources	DGRN, DGSA, Office of Agricultural Programming and Policies (OPYPA), Climate Change Unit in OPYPA (UASyCC). DGS	National Plan for Climate Adaptation National Plan for Climate Change Animal Welfare Policy	**Law No. 1876 /017**, National System for Agriculture Information (SNIA) **Law No. 18.381** and **No. 18.381**, information access and security **Law No. 19889** Animal Welfare Law

Component 2. Supporting a Transition to Agroecology

Project activities	Targeted MGAP agencies and departments	Policies to mandate the work in the sector	Existing Laws provide the basis of the work
Investment to develop a strategy for agroecology, identify technologies for Agro-ecological transition and help define a "green branding" to help enhance access to new markets. Investments in strengthening the INBA	DGRN, DGDR, DIGEGRA, DGSA, National Directorate of Forestry (DGF), DGSG, General Directorate of Biosafety Food Safety (DGBIA), National Institute of Agriculture Research (INIA), and Ministry of the Environment. National Institute for Animal Welfare (INBA)	National Agroecology Strategy National Environmental Plan Animal Welfare Policy	**Law No. 19717** Agroecology law **Law 14.859**, Decree N° 253/979, water care **Law 19,889** Article 291 established the Ministry of the Environment **Law No. 19889** Animal Welfare Law

Annex 4: Financial and Economic Analysis

Introduction

1. The main objective of the financial analysis is to examine the financial viability of the activities, which will be supported by this intervention. It assesses their potential for increased profitability as a result of project interventions and whether productive activities supported by the Project would offer sufficient financial incentives to attract participants amongst target group households. Cash incomes generated by Project activities would be adequate for the farmers and rural entrepreneurs to repay their additional investments in the technologies. Due to the "public good nature" of the Project, a classical financial analysis is not possible. The quantifiable benefits from a financial point of view are calculated for Component 1: Strengthening Decision Support Systems for Climate Resilience; and Component 2: Supporting a Transition to agro-ecological Production.

Component 1: Strengthening Decision Support Systems for Climate Resilience

2. The quantitative analysis will focus on benefits arising from the development information tools for risk mitigation and agriculture insurance. The pilot program will finance the risk insurance premium for 50,000 ha per year for three years, with the expectation that this support will promote the uptake. The crop distribution will follow the current one and the insurance uptake will increase of 2 percent per year. It is assumed that the 50,000 ha will continue to be under insurance adding to the existing 150,000 from year 4 and from there the 2 percent increase will be applied. After 10 years it is expected that the additional area under insurance for summer crops will be 78,000 ha. See Table 4.1 below.

Table A4.1: Additional area under insurance for summer crops

		Insured ha										
Targeted crops	% of cultivated land	Ha total pilot	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		50,000										
Soy	82%		41,000	41,000	41,000	44,280	47,560	50,840	54,120	57,400	60,680	63,960
Corn	13%		6,500	6,500	6,500	7,020	7,540	8,060	8,580	9,100	9,620	10,140
Sorghum	5%		2,500	2,500	2,500	3,020	3,540	4,060	4,580	5,100	5,620	6,140
Totals			50,000	50,000	50,000	54,320	58,640	62,960	67,280	71,600	75,920	80,240

3. Based on the data shared on past occurrence of drought in the country, a 30 percent probability of drought has been assumed, so one drought every three years. See Table 4.2.

Table A4.2: Drought occurrence

Number of years under consideration	18
Number of Drought	5
Probability of drought	28%
Period 2000-2018	18
Annual average lost in USD million	**92**

Source: OPYPA

4. The average loss due to the adverse events as been set at 30 percent of the production in the drought year. See Table 4.3 below the red columns.

Table A4.3: Expected production on pilot area and future land under insurance

			Production in Tons									
Targeted crops	Yield per Ha Tn	Ha total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Soy	2.171		89,011	89,011	89,011	96,132	103,253	110,374	117,495	124,615	131,736	138,857
Corn	6.536		42,484	42,484	42,484	45,883	49,281	52,680	56,079	59,478	62,876	66,275
Sorghum	4.525		11,313	11,313	11,313	13,666	16,019	18,372	20,725	23,078	25,431	27,784
Totals					DROUGHT			DROUGHT			DROUGHT	

Source: OPYPA and own calculation

5. The insured value is normally 80 percent of the production value. The assumption in this case is an insurance coverage of 80 percent. This translates into a covered value of 10 percent assuming the 30 percent loss, as the first 20 percent of the loss will not be covered by the insurance. Accordingly, the benefits expected by the insurance are highlighted below in the green columns. See Table 4.4 below.

Table A4.4: expected benefits from insurance (green columns)

			Benefit from insurance USD									
Targeted crops	Producer Price USD/Tn	Ha total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Soy	463		41,220,994	41,220,994	4,122,099	44,518,674	47,816,353	5,111,403	54,411,712	57,709,392	6,100,707	64,304,751
Corn	165		7,006,320	7,006,320	700,632	7,566,825	8,127,331	868,784	9,248,342	9,808,848	1,036,935	10,929,859
Sorghum	120		1,357,500	1,357,500	135,750	1,639,860	1,922,220	220,458	2,486,940	2,769,300	305,166	
Totals			**49,584,814**	**49,584,814**	**4,958,481**	**53,725,359**	**57,865,904**	**6,200,645**	**66,146,994**	**70,287,539**	**7,442,808**	**75,234,609**

Source: OPYPA and own calculation.

6. At the financial level, the gains appear clear and will help farmers to be back into production rapidly. Furthermore, the 30 percent loss is a national average, while some departments are more affected than others are. In this latter scenario where lost can reach up to 50 percent the insurance can be an invaluable support to farmers to quickly recover. Median farm size in Uruguay is now 360 hectares. The average avoided loss due to insurance for a farm, using the above median figure would be around US$36,000 for soya, US$39,000 for corn, and US$20,000 for sorghum. The average insurance premium per ha is US$50 per ha for an overall annual investment of around US$18,000 for a median farm size.

7. Three main categories of economic loss linked to poor canine management have been identified in the literature: loss of livestock; loss due to attacks on humans; and dog-induced road accidents. According to the preliminary calculation by OPYPA, the losses due to deaths of sheep due to canine attacks can be estimated at US$934,000 per year (0.3 percent of export earnings in 2019). It is important to note that this estimate is based on a set of assumptions and that changes in these assumptions can strongly affect the cost of canine attacks on sheep production. The basic assumptions are listed below:

a) Only establishments with commercial flocks of more than 50 animals were considered (10,239 establishments in 2016, according to the EGN61). Alternatively, all establishments with sheep (17,093) could be taken into account, which increases the estimate of damage at the national level.
b) According to the EGN, 71.3 percent of the establishments with commercial flocks were attacked by predators, while 46.9 percent were attacked by dogs (4,802 establishments with commercial flocks).
c) In the complaints received by Commission on Responsible Ownership and Animal Welfare (COTRYBA) from May 2016 to February 2017.
d) To assess the cost of dead sheep, the average weight per animal and the average price per kilo were used, with data from the National Meat Institute (INAC).
e) The overall number of sheep in the country is 6.6 million (2015 data), constantly decreasing in the last 10

years due to relative international prices (reached a maximum of 26 million in 1990's).

8. Furthermore, the canine management will help decrease the incidence of attacks to humans and road accidents. These additional costs have been estimated using the data from the paper from the "*Universidad de la Republica*". The costs for bite-related injuries were estimated at almost US$210,000 based on reported cases and over US$1,17 million based on an estimate that considers the underreporting of actual assaults. Road accidents caused by canines are 3.2 percent of the total accidents in 2015 and their cost was estimated at US$3.0 million. Overall, the costs to society associated to poor canine management amount to US$5.1 million per year using a conservative estimation. This figure will be the basis for the economic analysis calculation.

Component 2: Supporting a Transition to Agro-ecological Production

9. Specifically, the quantitative analysis will focus on benefits arising from investment in Cuenca Santa Lucia to improve water quality that will target 200 dairy producers to equip them with effluent management and promotion of agroecology practices by producers. This analysis is based on a biophysical model of water eutrophics from dairy effluents to estimate the potential impact of the effluent management and water quality restoration project, known as "*Convocatoria Cuenca de Santa Lucia*". The results show that the project would decrease the contribution of participating establishments to water pollution in the watershed one of the most important sources of water for Uruguay.

10. The results of the models show that the Project would be successful in achieving its goal of reducing water pollution. On the other hand, the project generates an unwanted increase in greenhouse gas emissions. However, in a cost-benefit exercise, it is concluded that the benefit of reducing pollution more than outweighs the damage caused by the increase in GHG emissions and the cost of project investments; however, this conclusion is sensitive to the social value of water quality. The investment targeting the dairy producer will not "per se" improve their productivity but will improve the water quality in the watershed serving water to almost 70 percent of Uruguayan. This activity will be led by DGRN. It will target 200 dairy producers in the Cuenca Santa Lucia watershed to equip them with effluent management technologies to achieve on-farm circular economy through nutrient cycling. For the purpose of the analysis, four representative dairy farms, considered as most relevant in the targeted areas, have been prepared and used see table 5 below:

Table A4.5: representative dairy farm in St. Lucia Watershed

Total farm	**200**			
	%	**# per typology**	**Value of positive externalities USD per year**	
without effluent ponds	44%	88	1,272,680	Typology A
Only with effluent ponds	34%	68	904,681	Typology B
Effuent ponds and sand	12%	25	254,450	Typology C
Effluend ponds and water treatment	10%	19	320,086	Typology D
Total			**2,751,897**	

Source: OPYPA and own calculation

11. Based on the typology different technical solution to treat the water effluent have been proposed based on the results of the on-going World Bank financed project DACC. The positive contribution on the environment is strong enough for each typology to justify the intervention ranging from US$16,500 for typology D to US$10,200 for typology C. Further benefits have been calculated from livestock-based agroecology support that will improve the productivity of meat per ha for 420 producers. Based on the calculation the change in production provides interesting and positive return to farmers while introducing innovative technologies. The average farmer will

improve the farm income by an initial US$7,500 per year on the land dedicated to the new technology.

Table A4.6: representative cattle farm

	Kg meat/ha without project	Gross product without project USD/ha	Production costs USD/ha without project	Kg meat/ha with project	Gross product with project USD/ha	Production costs USD/ha with project	Increase in income per ha	Total additional USD benefit per producer per year assuming 50% of the total ha under agroecology
Average producer with 500 ha	70	120	100	100	170	120	30	7500

12. The economic analysis uses a cash flow model over a 20-years period that includes all investment and operational costs of the Agro-ecological Climate Resilient System Project, as well as the incremental net revenues derived from the financial models. The economic costs of the Project have been calculated using estimated investment and maintenance costs. Total project investment cost has been estimated at US$52.5 million with an IBRD financing of US$35.5 million and Government contribution of US$17 million over five years of implementation. The yearly economic costs that are likely to persist after project closure have been estimated as equal to the 10 percent of the last year of total costs, equivalent to US$1 million each year of the analysis. For the economic analysis purpose, all the costs have been considered as they are all related to project implementation and will contribute to the success of the activities.

13. The overall program economic cash flow and corresponding economic internal rate of return (EIRR) have been calculated by aggregating the net incremental benefits to the beneficiaries as a result of the project interventions (with an opportunity cost of capital of 12 percent). The economic analysis is based on direct costs and benefits. Social, institutional, and indirect benefits will not be taken into account. These include, for example, creation of employment, enhanced competition in input markets, enhanced national food security, export improvement, foreign currency earnings and emergence of farmers' organizations. An economic conversion factor of 0.9 has been taken into account for benefits generated by the Project. The total benefits have been calculated by aggregating economic returns from:

(a) The 50,000 ha under the insurance pilot scheme and the subsequent increases in insured farming area, assuming a 2 percent annual increase based on similar projects in the region.
(b) The reduction in costs resulting from the canine management, assuming a reduction of 50 percent of the annual costs suffered by the society, with a phasing of benefits increase over 10 years.
(c) The water effluent management in the Santa Lucia Basin, obtained by aggregating the positive value associated with the 200 subprojects financed by the Project.
(d) The increase in benefits from the agro-ecology that will promote the agriculture transition in Uruguay for 700 producers.

14. Given the above assumptions, the EIRR for the base case scenario is 17.1 percent and the Net Present Value (NPV) is US$9.3 million. These results indicate that, based on an opportunity cost of capital of 12 percent, the project shows a satisfactory EIRR and NPV, and is justified on economic grounds. The sensitivity analysis, to consider among other factors, both possible COVID-19 future impacts on the economy and climate change confirms that the EIRR and NPV are robust, see Table A4.7 below. The switching values are high, meaning that even a significant increase in costs or decrease in benefits do not affect the economic viability of the project. However, a delay in benefits by 2 years shows an EIRR below 12 percent (the minimum acceptable level).

Table A4.7: EIRR sensitivity analysis

Base case scenario	Project Benefits					Project Costs		Delay in benefits	
	-30%	-20%	-10%	+10%	+20%	+10%	+20%	1 year	2 year
17.1%	8.8%	11.7%	14.4%	19.9%	22.7%	14.7%	12.6%	13.6%	11.2%
						Total costs		Total benefits	
Switching values						23%		-19%	

15. In accordance with the World Bank's Environmental Strategy and its Climate Action Plan, the carbon balance (net GHG emissions' reduction) of the Project has been evaluated and integrated into the economic analysis. Along the 20-year-period of analysis, the Project would lead to a reduction of 1,121,216 tCO2e emissions. The economic value of the net reduction in CO2eq emissions, given the project's interventions, is valued at shadow prices, and is included in the economic analysis – in accordance with the guidelines of the World Bank: "Guidance note on the shadow price of the carbon in the economic analysis" (September 2017).

Table A4.8: Summary of Economic Indicators - Baseline, LCP, and HCP case scenarios

Indicator	Baseline	LCP	HCP
EIRR	17%	33%	79.8%
ENPV (US$ million)	9.3	29.9	50.1
Switching value for costs	+23%	+84%	+132%
Switching value for benefits	-19%	-46%	-58%

16. 'Low carbon price' (LCP) and 'High carbon price' (HCP) case scenarios are provided in the analysis to complement the base case scenario. Under the LCP scenario, the economic internal rate of return (EIRR LCP) is 33 percent, the economic net present value (ENPV LCP) is US$29.9 million, the switching value for costs is +84 percent and the switching value for benefits is -46 percent. Under the HCP scenario, the economic rate of return (EIRR HCP) is 79.8 percent, the economic net present value (ENPV HCP) is US$50.1 million, the switching value for costs is +132 percent and the switching value for benefits is -58 percent.

Annex 5: Women in Agriculture in Uruguay

Institutional framework

1. **Uruguay has a National Law on Gender Equality (*Ley de Igualdad de Genero No 18.104*) and a National Institute for Women Affairs (*Instituto Nacional de Mujeres*, INMUJERES).** The institute formulates and implements social inclusion policies that promote equality of opportunity between women and men.[64] It includes key stakeholders from several ministries, including MGAP. INMUJERES leads the National Gender Council (NGC) and prepared the Plan for Equal Rights and Opportunities based on a gender approach for 2007 to 2011. The implementation of the Plan advanced gender equality, equitable development, the fight against domestic violence and the recognition of women's ethnic diversity.[65] In 2017, the NGC elaborated the National Strategy for Gender Equality 2017 to 2030. The strategy aims to enhance gender equality policies and includes strategic areas of actions such as climate change, agriculture, and rural livelihoods. This law and strategy provide a multisectoral framework for action by public institutions.

2. **Within this general framework MGAP has its own Gender Specialized Commission and a National Plan for Gender in Agriculture and Livestock Policies (published in 2021)**. The objective of the Commission is to mainstream gender into their internal policy as well as their activities. The Plan is the tool to be used to mainstream gender into agricultural and livestock public policies. It promotes equality in the agricultural and livestock value chains and the development of women's potential as producers, businesswomen and decision-makers to improve their living conditions and in this way increase national production. In 2018 MGAP participated in the Climate Change and Gender Working Group, which formulated the Gender and Climate Change Strategy. The strategy is a synergy between the Climate Change Policy and the National Strategy for Gender Equality and aims to mainstream gender into dimensions of climate change policies.

Gender gaps in Uruguay's Agroecological system

3. **Invisibility of women's roles and responsibilities. One of the major gender gaps in Uruguay's agricultural sector is the lack of accurate, reliable information on the work of women**. In Uruguay, sex-disaggregated data on agricultural livelihoods are not collected consistently in rural areas, nor are they fully analyzed.[66] According to the 2011 agricultural census, women account for 27.3 percent of the 115,000 people working in agriculture in the country. However, when considering unpaid work, 41 percent of women participated in agricultural activities.[67] This discrepancy is mainly due to social and cultural norms, which consider women's work as "support" to the work of men or an "extension" of domestic activities.

4. **Lack of institutional capacity to adequately identify and address female farmers' needs/challenges.** Data limitations constrain the ability of decision-makers and those providing technical assistance to fully understand the distinct roles and responsibilities of women and men involved in agricultural production as well as the challenges they may face (Doss & Kieran, 2014).

5. **Cultural and social norms leading to occupational sex segregation in the agricultural sector**. Men in a vast majority tend to hold agricultural responsibilities that are associated with the high hierarchic roles such as

[64] World Bank. FY2016-FY2020, Country Partnership Framework Uruguay
[65] Consejo Nacional de Genero, 2017. Estrategia para la Igualdad de Genero
[66] FAO – UNDP, 2019. Making the case for gender-responsive adaptation planning in Uruguay: The importance of sex-disaggregated data.
[67] Oficina de Planeamiento y Presupuesto, 2019. Mujeres Rurales, Trabajo y Acceso Productivo

intellectual work, decision-making roles, and roles linked to public spheres while women are in charge of domestic work. There are no specific statistics available for the kind of unpaid work women do in agriculture. Women carry out multiple activities that vary according to the needs of the farm such as tending to animals or pre- and post-harvest duties[68]. Women face a double invisibility in the agricultural sector. Work of women is socially not recognized as "work" but a necessary help to the principal activities of the farm, while household responsibilities that are almost exclusively performed by women is not recognized as real "work"[69]. Lack of opportunities in leadership and decision-making roles and continuously un-recognized work contribute to the dependence of women.

6. **Use of Time. The traditional assignation of the role of women for domestic and care work is a barrier for their presence in agriculture.** Women are responsible for the functioning of the household and care of family members. Women carry out 94 percent of domestic work, 87 percent of management of household chores and 70 percent of the care of family dependents.[70] Additionally, around 55 percentage of women responsible for the household work as well in agricultural activities and 20 percent has a paid job outside the farm.[71] This shows that women have a higher labor weight than men.

7. **Access to agriculture knowledge. Women have limited access to technical education, extension and training in agriculture, thus lower productive opportunities.** MGAP policies provide subsidies and technical assistance to improve agricultural production. According to MGAP in 2014 only 22 percent of the population that benefited from this assistance were women.[72] Among other constraints, specific demands and needs of women are often overlooked in design and development of technical assistance. For instance, lack of trainings on improved practices and technology/innovation in management, barriers to participate in training activities (e.g., time poverty and care responsibilities), as well overall limited institutional capacity (including of facilitators/trainers) to identify and address the specific needs of female farmers, may limit women's access and interest in participating to training activities.

Access to services and inputs, capacity to address climate change

8. **Women with limited access to information tools and systems in the sector compared to male farmers.** According to MGAP, women represent 28 percent of total users of existing information tools and systems). This is due to underlying constraints, among others, women in rural areas tend to have less access to ICTs and lack of digital skills, they tend to be unaware of existing tools and systems and when they are, information content and provision is not meeting their needs[73].

9. **Limited access to inputs and resources undermines the role women can play as agents of change towards more sustainable models of production.** According to MGAP and UNDP (2019), while women plan to engage in adaptation, they often do not have the financial resources to implement adaptation practices. This builds on the fact that female farmers tend to have less resources to invest in technology and equipment in agriculture and development policies in the sector have not considered such barrier .

[68] Gallo y Peluso, 2013. Estrategias sucesorias en la ganadería familiar. Un enfoque de género
[69] Oficina de Planeamiento y Presupuesto, 2019. Mujeres Rurales, Trabajo y Accesso Productivo
[70] Oficina de Planeamiento y Presupuesto, 2019. Mujeres Rurales, Trabajo y Acceso Productivo
[71] Batthyány, K. 2013, Uso del tiempo y trabajo no remunerado: división sexual del trabajo y contratos de género.
[72] MGAP in 2014 recorded three announcements for rural development assistance. The three initiatives were for the agroforestry sector, dairy and ovine sector. Women beneficiaries were 21 percent for agroforestry, 17 percent for dairy and 25 percent for ovine of the total beneficiaries.
73 According to FAO and MGAP (2021), women often feel that existing information tools and systems fail to meet their needs and that they are not targeted (e.g. information shared through mobile phones tend to reach male users). In addition, such tools and systems tend to reinforce gender stereotypes by showing men as role models.

10.**Gender-related actions and indicators.** The project will increase access to services (information tools and systems) in agriculture and climate change, especially for female farmers by:

a) Development of the pilot "Women playing a leading role in environmental-related information systems" (*Programa Mujeres Protagonistas de los Sistemas de Información Ambiental*), Activity 1.6. The pilot will specifically target female farmers through i) provision of digital devices (2,000 tablets/notebooks); ii) digital literacy trainings; iii) skills development to access and use Ministry-designed information tools and systems under component 1.

b) Design and development of information tools and systems to meet specific demands of female and male farmers, in relation to both knowledge content and information sharing. In this line, the project will support: i) the development of a platform's interface on apiaries in the system for management and monitoring of agricultural chemicals (Activity 1.2), following a specific demand of the Rural women's association of Uruguay (*Asociación de Mujeres Rurales del Uruguay*, AMRU for its Spanish acronym); ii) information sharing to adhere to the "Inclusive communication guidelines" (developed by the Gender Committee, *Comisión Especializada en Género - Agro*), to ensure communication and language to be inclusive and use of user-friendly data visualizations and other suitable formats; iii) dissemination activities on Soil Use and Management Plans and Natural Resources Management System to involve women's groups and their networks (e.g. AMRU, *Red de Grupos de Mujeres Rurales del Uruguay*).

11. In addition, the project will strengthen the institutional capacities for sex-disaggregated data collection and policy formulation, implementation, and evaluation in line with women' and men' specific needs and challenges. Capacity building will be targeting SNIA, DGSA, DGRN, and OPYPA teams involved in implementation of activities 1.1, 1.2, 1.3, 1.4 and 1.5. Moreover, the project will contribute to the Generation of Environmental and Agriculture Indicators and Tracking (Activity 1.5), including supporting OPYPA team to report on gender-related and sex-disaggregated indicators within the MRV framework in line with Uruguay's NDC commitment

12. **Indicators to monitor narrowing of gender gap in relation to access to information.** At PDO level: Women accessing climate change information and data services and tools provided by the project (with a target value of 43 percent of total users). Moreover, additional indicators are included in the Result framework: female farmers provided with digital devices; female beneficiaries capacitated in the use of Ministry Systems.

13. **Component 2: Supporting a Food System Transition to Agroecology.** Under Activity 2.3, the project will increase access to knowledge (technical education, extension, and training) and productive inputs (technology and equipment) for agro-ecological transition, especially for female farmers and their groups by:

a) Call for proposals (subprojects) for agro-ecological transition to adhere to the "Inclusive communication guidelines" (developed by the Gender Committee, *Comisión Especializada en Género - Agro)*). This to include communication materials/language to be inclusive, information sharing through women's groups/networks, etc., to ensure women and their groups are aware of and have access to project's investments (support to knowledge and productive inputs for agro-ecological transition).

b) Selection process and eligibility criteria for subprojects to set a target for women-led subprojects having access and benefiting from productive inputs (technology and equipment) and technical assistance for agro-ecological transition.

c) Provision of productive inputs (technology and equipment) and technical assistance to be defined based on capacity/needs assessment to identify specific needs of female and male farmers. With this goal, the project will support the development and adoption of a training manual for facilitators/trainers (MGAP team, technical advisors, extensionists, territorial agents, etc.) and a checklist to identify and address specific needs

of female and male farmers in capacity building ("Guidelines and tools to address gender-related issues in capacity building", this to be led by the Gender Committee of MGAP). Measures to include ad hoc trainings on agro-ecological transition for women; training content to cover implementation of practices and technology/innovation in management; timing and location to meet women and men's needs and complementary services such as childcare.

d) Awareness and training activities on the above-mentioned manual and checklist on gender to target facilitators/trainers at different level (MGAP team, technical advisors, extensionists, territorial agents, etc.). In this line, certification for facilitators/trainers to include sessions on the manual and checklist to be developed.

14. In addition, the project will increase the visibility of female farmers as leaders of subprojects and playing as role models in the sector by:

a) Identification of subprojects as demonstration sites to ensure 50 percent of those selected are led/co-led by women. This will also include the organization of farmers field days on the demonstration sites to promote exchange of experience among female farmers and women's networking.
b) Involvement of all farmers (e.g., members of agriculture related businesses) in capacity building activities, not only those with a decision-making role. This to ensure farmers playing a "supporting role" (especially women) to access and benefit from project opportunities.

15. Under Activity 2.4, the project will increase the visibility of female producers in the dairy sector by developing tools for data collection to monitor access, control and use of productive assets, as well as participation in management and in decision-making for female and male producers in the sector. More specifically, this will include the organization of a workshop to develop indicators to collect sex-disaggregated data in relation to access to and use of socio-economic assets, participation in groups, roles in household decision-making, capacity to implement adaptation practices, etc. A pilot tool for data collection and analysis will be developed and tested in the targeted area (Cuenca Santa Lucia) and will then inform INALE's communication campaign aiming at recognizing contribution of female producers and promoting their visibility in the dairy sector.

16. In addition, to promote visibility of women in relation to Animal Welfare (Activity 2.2), the development of the National Animal Welfare Plan will include a communication campaign to ensure targeting of women (e.g., through women's groups and organizations) under the One Health approach. This to include involvement of female professional networks to ensure female veterinarians are aware of and have access to planned capacity building activities and are engaged in communication campaign.

17. **Indicators to monitoring narrowing of gender gaps in relation to access to knowledge (technical education, extension, and training) and productive inputs (technology and equipment).** At PDO level: female farmers adopting improved agricultural technology (with a target value of 41 percent of total farmers). Moreover, additional indicators are included in the Results Framework: women-led subprojects supported with technology for an agro-ecological transition; female producers with knowledge and skills of agro-ecological transitions from the project (with a target value of 40 percent of total).

18. **Project Management:** A specific gender unit under of MGAP will ensure adequate support to overall implementation and monitoring of gender-related activities, including appropriate monitoring of sex-disaggregate data throughout general activities. At intermediate level: female trained in themes related to Animal Wellbeing (with a target value of 50 percent of total trained); female beneficiaries reporting satisfaction with project activities; female beneficiaries of project investments (with a target value of 50 percent of total beneficiaries).

Annex 6: Examples of Technologies for an Agro-ecological Transition

1. As part of Component 2, INIA will develop a strategy to define an on-farm agro-ecological transition. During research, the emphasis will be placed on knowledge and technologies that promote "Agro-ecological transitions", that is, changes in production systems that make them more sustainable than the ones they are trying to replace. This strategy will be accompanied by close monitoring and evaluation to: examine specific aerial and underground diversity, reduce the applications of synthetic products, maintain or restore natural or semi-natural areas, protect and efficiently use natural resources, recycle and reuse, promote the diversity of habitats, integrate practices at a landscape level, take the one-health perspective, facilitate the participation and training of producers, promote the exchange of knowledge, promote rural and territorial development, bring production closer to consumers, improve nutraceutical quality and food safety and reduction of GHG emissions. The following table below presents INIA's preliminary thinking on what could be considered an agro-ecological technology. This table presents a brief description of the technology, the production systems in which it would operate and the dimensions on which it would impact.

Table A7.1. Agro-ecological Transition Technologies and Climate Benefits

Technology	Description	Productive System	Climate Contribution
Agro-ecological management of "chinches" in soybeans	Alternatives to control "chinches" in soybeans using attractant crops as preferential food for the pest and associated live barrier-type crops.	Agricultural	Adaptation
Pest management in deciduous fruit trees: towards an Agro-ecological north	Lepidopteran control in fruit trees by massive trapping with semi-chemical attractants. Biological control of the pear Psila through the management of the supply of habitats of natural enemies	Intensive Vegetable	Adaptation
Weed management in livestock and agricultural systems	Design of a combined mechanical and chemical weed control strategy in agricultural-livestock systems. Cover crops combined with desiccation rolling to reduce the establishment of weeds in field crops	Agricultural - Livestock	Adaptation
Carbon storage and sequestration in soils of Uruguay	Promotion of carbon sequestration in the soil through crop rotation and sequence, and direct seeding. Validation of simulation models of carbon and nitrogen dynamics in the long, medium, and short term.	Agricultural livestock Intensive vegetal	Mitigation
Vegetable covers and soil management in the citrus industry of Uruguay.	Increase in water availability, decrease in erosion and in the viability of pathogens and seeds with the incorporation of organic mulch in the row. Sowing vegetation mat in the between row reduces erosion and compaction of the soil.	Intensive vegetal	Adaptation and Mitigation
Evaluation of the structural and functional heterogeneity of natural grasslands for their management	Identification, description, and creation of evaluation protocols of natural grassland communities for livestock use in Uruguay.	Livestock	Adaptation and Mitigation
Use and management of the microbiome for the development of bio-inputs for agricultural use	Identification, characterization, bioproduction and formulation of inputs from soil microorganisms. Development of bio-inputs for plant protection and nutrition.	Intensive vegetal Agricultural/Forestry	Mitigation
Rhizobial inoculants and contribution of nitrogen from the atmosphere to production systems	Selection of efficient, competitive, and persistent rhizobia strains using naturalized and adapted strains. Study of the ecology of the FBN (life cycle analysis) with the aim of	Agricultural-Livestock Intensive vegetal	Mitigation

Technology	Description	Productive System	Climate Contribution
	achieving rhizobia inoculants for legumes sustained in the FBN.		
Local Cultivars and Horticultural Improvement in Agro-ecological Transition Processes	Obtaining more productive cultivars, adapted to agroclimatic conditions and local production systems (sweet potato, potato, onion, strawberry, tomato, garlic, and peanut). Incorporation of resistance to pests and diseases.	Intensive vegetal	Adaptation and Mitigation
Local cultivars and fruit improvement	Genetic improvement of fruit trees aimed at obtaining varieties resistant to diseases and adapted to the agroclimatic conditions of Uruguay. Recover, enhance, and promote the cultivation of native fruits.	Intensive vegetal	Adaptation
Research and application of animal genetic improvement: effects on the environmental dimension of the sustainability of livestock production	Direction of selection indices of cattle and sheep towards greater conversion efficiency, resistance to gastrointestinal parasites and incorporation of the direct selection criterion "methane emission".	Livestock Diary	Mitigation
Use of shade as a tool for mitigating the risk of heat stress in animal production systems	Implantation of "forest" with native species for thermal shelter of animals. Increases animal welfare, weight gain and milk production in cattle.	Livestock Diary	Adaptation
Model for the optimization of land use planning (MOPUS) in dairy basins with productive and environmental objectives.	Developing of a model that works at different levels (from plot to micro-basin) and that considers multiple conflicting objectives. The model allows management decision making by minimizing phosphorus export to the basin and contemplating production objectives	Diary	Adaptation
Information and communication technologies (ICTs) as contributions to the Agro-ecological agriculture transition	Development of information systems for planning and management decision making. Availability and free access to information through web portals and Apps.	Intensive vegetal; Livestock; Agricultural-Livestock Dairy; Forestry; Family Farming	Adaptation
Contributions to disease management in agricultural systems	Development of chemical control strategies for diseases based on thresholds, assisted by a prediction system (DON, SARAS, Brusone Alert). Design of rotations that minimize the incidence of diseases	Agricultural Rice	Adaptation
Management of horticultural and fruit diseases	Design of integrated management of tactics (solarization and bio-inputs) and strategies (crop rotation, green manures) for the management of horticultural and fruit diseases.	Intensive vegetal	Adaptation
Crop and Pasture Rotations - The basis of agricultural-livestock systems that produce grains, meat, and ecosystem services.	Sequence design of crop and pasture rotations to minimize erosion, promote nutrient cycling and soil biological activity	Agricultural Agriculture and livestock	Adaptation and Mitigation
Grazing management as an Agro-ecological transition tool in dairy systems	Optimization of forage harvesting to increase the lifespan of perennial pastures	Dairy	Adaptation
Service Crops	Evaluation of service provision (carbon sequestration, erosion reduction, pest and weed control, water regulation) of non-harvest crops	Agriculture - livestock	Adaptation and Mitigation

Annex 7: Map of Uruguay